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CONCEPTUAL SYSTEMS AND EDUCATIONAL ENVIRONMENT: RELATIONSHIPS BETWEEN TEACHER CONCEPTUAL SYSTEMS, STUDENT CONCEPTUAL SYSTEMS, AND CLASSROOM ENVIRONMENT AS PERCEIVED BY FIFTH AND SIXTH GRADE STUDENTS

A Dissertation Presented

By

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Dedicated to Werner Stutzel

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ABSTRACT

This study determines significant relationships between teacher conceptual systems, student conceptual systems, and student perceptions of the classroom educational environment in selected elementary schools. Data were obtained from 1,180 fifth and sixth grade students and 52 teachers in twelve Western Massachusetts elementary schools. Sinclair and Sadker's Elementary School Environment Survey (ESES) was used to obtain student perceptions of the classroom educational environment variables of Involvement, Humanism, Autonomy, Morale, Equity, and Resources. Teacher conceptual systems were measured by teacher responses on Harvey's "This I Believe" Test (TIB). Each sampled teacher was identified with one of four conceptual systems: I, II, III, or IV. Student conceptual systems were assessed through

student responses on Harvey and Prather's Student Self-Conception Test (SSCT). Students were classified into one of four categories: Need for Structure, Hostility, Sociability, or Independence.

The following hypotheses were generated by a theoretical approach including a comprehensive review of existing research and a process of logical deduction:

1. There will be significantly higher scores for Involvement in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

2. There will be significantly higher scores for Autonomy in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

3. There will be a significantly higher number of total positive responses across environmental variables in the classrooms of System IV teachers than in the classrooms of System I, System II, and System III teachers.

4. There will be a significantly higher number of total positive responses across environmental variables by those students whose conceptual systems are similar to their teacher's than by those students whose conceptual systems are dissimilar to their teacher's.

Analysis of variance procedures were used to test the four hypotheses. The results confirmed the second and fourth hypotheses but did not support the first and third. There were significantly higher scores for Autonomy in the classroom educational environment of System III ($p. < 01$) and System IV

($p < .05$) teachers than in the classroom educational environment of System I teachers. This finding led to the acceptance of the second hypothesis. In addition, it was found that the scores for Autonomy across the classrooms of System III teachers were also significantly higher than those of System II ($p < .01$) and System IV ($p < .05$) teachers. The analysis of variance between the environmental perceptions of the students similar to the teacher in conceptual system and those dissimilar indicated that significant differences ($p < .001$) existed between the two groups for total positive responses on the ESES. Based on this finding, the fourth hypothesis was accepted. Finally, a comparison of the matched and mismatched groups of students revealed significant differences for the variables of Involvement ($p < .001$), Humanism ($p < .001$), Morale ($p < .001$), Equity ($p < .001$), and Resources ($p < .01$).

Findings led to the conclusion that a significant positive relationship exists between System III teachers and Autonomy in the classroom environment and that a significant negative relationship exists between System I teachers and Autonomy. Also, it was concluded that a significant positive relationship exists between teacher-student conceptual system similarity and positive student perceptions of the classroom environment. Additionally, an overview of the findings led to the tentative conclusion that the match or mismatch of students and teacher is more important in determining student perceptions of the environment than is the teacher conceptual system per se.

This study suggests that educators invested with responsibility for training teachers and administrators should devote far more attention to classroom environment and to the matching of teacher-student conceptual systems. It is also important for schools to be characterized by more pluralistic environments in order to meet the diverse needs of individual learners. Finally, the study suggests the need for research of a more experimental nature designed to determine causal relationships between conceptual systems and classroom environment.

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CHAPTER I

INTRODUCTION

One of the most important tasks facing educators is the creation of nurturing learning environments for all children. In elementary school classrooms throughout the country children continue to experience underachievement and failure, while educators continue to ignore variations in the educational environments that contribute to these conditions. Similarly, although there is considerable evidence (Bloom, 1968; Cronbach, 1967; Gagne, 1967) that no single educational environment provides optimal learning for all students, most classrooms remain environmentally monolithic. Finally, in spite of the evidence (Hunt, 1971; Harvey, 1970b) suggesting that educators should carefully match students, teachers, and educational environments to foster student intellectual growth and achievement, this matching is determined largely by chance in most schools.

Much of the related research in the field is similarly mindless. As Sinclair (1971, p. 4) indicates, while "theories of learning and behavior acknowledge the influence of environment on the development of human characteristics. . . there is no accordant attention given to identifying compelling environmental variables that actually exist in schools." Research on the class-

room behavior of teachers and students has been greater in quantity than environmental research, but has been limited by its focus on the traditional monolithic classroom. The most recent edition of the authoritative Encyclopedia of Educational Research (Ebel, 1969) fails to include any reference to the major studies concerning the matching of students, teachers, and environments.

Nevertheless, a number of contemporary educators are inquiring into these problems and beginning to suggest possible solutions. Sinclair (1968, 1971), Sadker (1971), Bender (1971), and McKay (1971) have provided valuable data concerning variations in elementary school educational environments. Bloom (1968), Cronbach (1967), and Gagne (1967), have focused their research and development efforts on edueational programs designed to meet the different needs of individual children within the same classroom. Hunt and his associates (1971), focusing on the relationship between teacher coneeptual systems, student coneeptual systems, and classroom environments, have worked to develop multiple environments for learning within the same school, and in training teachers to develop the skills needed to radiate a wide variety of environments.

A eomprehensive approaeh to the problem has been suggested by Joyce (1972). The great challenge of the future, according to Joyce (p. 170) is to "develop entirely new modes of education, designed to help people create new solutions to problems, and to define problems that were not perceived before at all." To meet this challenge, he calls for (pp. 186-187) the creation of pluralistic schools and classrooms and for the creation of "an array of

environments, each serving students in a particular kind of way."

In summary, the problem of underachievement and failure among elementary school children is a major one. The separate studies of Sinclair, Bloom, Hunt, and their associates represent significant efforts to solve the problem. Finally, the approach to the problem suggested by Joyce represents one viable alternative.

Thus, the present study begins with the assumption that in answering the question "Education for what?" we must give major attention to developing multi-faceted educational environments designed to meet the diverse needs of individual learners. Further, this study assumes that in order to develop these environments and to match students, teachers, and environments, requires continued inquiry into the nature of classroom educational environments and into the relationship between teacher characteristics, student characteristics, and classroom educational environments. Finally, this study contributes to understanding the relationships among these important dimensions of schooling by providing some answers to the following questions:

1. What is the relationship between teacher conceptual systems and student perceptions of the classroom educational environment?
2. What is the relationship between teacher conceptual systems and teacher ability to radiate a wide variety of educational environments?

3. What is the relationship between teacher-student conceptual system similarity or dissimilarity and student perceptions of the classroom educational environment?

The purpose of this study is conceived in response to these questions.

Purpose of the Study

The purpose of this study is to determine significant relationships between teacher conceptual systems, student conceptual systems, and student perceptions of the classroom educational environment in selected elementary schools. The investigator measures the conceptual and environmental variables and determines significant relationships between teacher conceptual systems and designated features of classroom educational environment. Teacher and student conceptual systems are investigated to discover significant relationships between conceptual system similarity and student perceptions of educational environment existing in classrooms. Finally, implications for teacher and administrator training, school improvement, and further research are advanced.

Meaning of Major Variables

The three major variables measured in the present study are classroom educational environment, teacher conceptual systems, and student conceptual systems. The definitions of these major variables include a number of sub-factors. The meanings of the variables are described below.

Classroom Educational Environment - Educational environment is defined as "the conditions, forces, and external stimuli which exert an influence on the individual. The environment is conceived to be a complex system of situational determinants fostering the development of individual characteristics. The determinants may be factors of social, physical, and intellectual significance." This conceptualization of environment, developed by Sinclair (1971, p. 3), is based on an earlier assumption by Murray (1938) that behavior is a function of a transactional relationship between the individual and his environment.

Building on this rationale, Sinclair (1968) defined and measured five environmental variables that exist and differentiate among elementary schools: practicality, community, awareness, propriety, and scholarship, and developed the Elementary School Environment Survey (ESES) to measure the manifestations of each variable in elementary schools. Sadker (1971), cooperating with Sinclair in a study of educational environments as perceived by 6000 children in fifty-four elementary schools, further refined the meaning of educational environment to include six new factors: alienation, humanism, autonomy, morale, opportunism, and resources.

The two negatively described factors, alienation and opportunism, have been changed to involvement and equity in order to provide a positive thrust for all factors. The environmental conditions and happenings included in the definition are manifest in the following descriptions:

1. Involvement

Environments which score high on this factor reflect the presence of a student body which feels involved in classroom activities. A sense of belonging is emphasized in this environment, and this sense of belonging is buttressed by a concern for students. Students demonstrate their involvement by internalizing class objectives in such areas as academic pursuits and obedience to classroom rules and regulations. The atmosphere is congenial and there is a cohesiveness and a sense of togetherness in this climate.

A low score on this factor demonstrates a feeling of estrangement in the environment. This feeling of alienation could in fact lead to destructive acts against the classroom itself.

In conclusion, this factor encompasses environmental characteristics such as cohesion, concern, and a sense of involvement.

2. Humanism

The items in this factor reflect a concern for the value of the individual. It is a supportive climate and is marked by courtesy.

In addition, this value placed on the individual is carried over to his personal acts of expression, specifically aesthetic expression. This climate demonstrates a concern for creativity, and it is supportive of poetry, music, painting, and theatre.

A classroom characterized by this atmosphere is concerned with the integrity of the individual and a concern for his cultural and aesthetic expression.

3. Autonomy

A high score on this factor suggests an environment which supports and encourages student independence. This climate suggests student initiative as well as

autonomy. Emphasis on procedures and supervision are minimized. Self-direction rather than obedience to the rules of protocol is important. Individual differences, both in opinion and academic interests, are stressed. Another aspect of this environment is that the lines of communication between learners and teachers are open and candid.

This environment affords the student the opportunity to share in the responsibility for his own learning.

4. Morale

The statements in this factor relate to student attitudes towards the classroom. A high score on this factor indicates a friendly and cheerful classroom environment. This environment may be described as a happy one in which learners and teachers have a warm relationship.

A low score on this factor indicates a negative student attitude towards the class and suggests poor relations between learners and teachers as well as disruptive student behavior.

The factor is concerned with student attitudes toward the classroom, and the cooperating behavior which relates to such attitudes.

5. Equity

The items in this factor reflect the degree of equity versus opportunism in the environment. A high score on this factor suggests a climate in which individuals are treated equally and do not gain socially or academically through preferred treatment.

A low score on this factor suggests a climate in which one gains social capital and academic status by behaving in an appropriate manner with important and powerful people. Informal political procedures and the importance of personal relationships are emphasized.

> This environment seems to be categorized by an absence of entrepreneurial behavior and political maneuvering.

6. Resources

> The items in this factor reflect the number of optional learning opportunities available to and initiated for the students. The emphasis here is on the availability of in-class as well as extra-class resources. Included in this category are such resources as written materials, field trips, television, exhibits and music. The availability or friendliness of the teacher as a supporting service for learning is also included in this dimension. Classrooms which score high on this factor offer a wide variety of learning opportunities to learners. (Sadker, 1971)

Conceptual Systems - Conceptual system is defined (Harvey, Hunt, and Schroder, 1961, pp. 244-245) as a "schema that provides the basis by which the individual relates to the environmental events he experiences." Amplifying this, Hunt (1971, p. 18) indicates that, "a system characterizes the organizational structure through which a person processes information or 'reads' events. It is concerned with how information is processed not with the content of information. Systems also have an important interpersonal component in that they characterize the form of self-other relatedness or interpersonal orientation: how the person conceptualizes himself, others, and the relationship between himself and others."

The work of O. J. Harvey, a primary referent in this study, is derived from the initial work of Harvey, Hunt and Schroder (1961), and has concentrated on four conceptual systems. These systems, utilized in the present study, are

defined by Harvey (1971) as:

System I

This system, the most concrete mode of construing and responding to the world, is manifest in such characteristics as: high absolutism and closedness of thought and belief; high evaluativeness; high positive dependence on, or cathexis with representatives of institutional authority; high identification with social roles and status positions; high conventionality; and high ethnocentrism or strong beliefs in American superiority. Except in response to guides from formal or institutional authority, System I individuals appear to rely upon their own internal standards to a greater extent than representatives of the other systems, especially System III. It is thought, however, that System I individuals, more than representatives of the other systems (particularly System IV), maintain their measure of independence from non-authority cues through conceptual closedness and contrast, which tend to prevent potentially conflicting inputs from entering their conceptual or interpetative matrix.

System II

This system, immediately above System I in abstractness, is manifest in individuals who are distrustful of authority cues but at the same time are devoid of any other reliable and stable guidelines. They, more than persons of any of the other systems, seem to be in a psyehological vacuum, guided more by distrust of and rebellion against the formal norms of society and against the perceived social pressures than by positive adherence to personally-derived standards. Though representatives of this system tend to display negative valence toward the same referents that are of positive relevance to System I individuals, it is important to note that both use these same external sources as points of reference.

System III

This system, the next to highest in level of abstractness, is manifest in individuals with generally inflated notions of themselves as causal agents in effecting desired

outcomes in their worlds. While attributing greater causality to themselves than do invididuals from Systems I and II, the representatives of System III, because of restricted experience in solving their own problems, develop at the same time a more generalized dependency upon others than do persons from any of the other systems. With the exception of the conformity of System I individuals to authority-related cues, System III representatives are thought to be the most acquiescent to conflicting opinions from the generalized "other." They appear to need constant feedback from significant people in their environment in order to regulate their behavior and attain the acceptance and mutual dependency they need. This kind of unthinking social accommodation and the seeking of a large number of friendships are two of the techniques used by the System III individual to avoid having to rely upon his own resources in the solution of problems in his everyday world.

System IV

This system, the more abstract end of the continuum, is manifest in individuals who have highly differentiated and integrated conceptual systems and, consequently, are more information and task oriented, more relative in thought and action, more open and sensitive to minimal cues in the environment, but at the same time more reliant upon their own opinions and perceptions as valid criteria for decision and action than are persons of the other systems. Faced with new or deviant inputs, System IV individuals appear more capable of admitting the impingements into their cognitive matrix, of examining and entertaining them, and of accepting or rejecting them in terms of consonance with their own standards than persons from other systems. Such individuals, therefore, are neither indiscriminate yielders to, nor invariant rebels against the prescriptions and suggestions perceived as coming from authority. They display a low need for structure, relatively high tolerance for ambiguity, an ability to differentiate between means and ends, an ability to articulate several ways of attaining the same goal, a capacity to "act as if," a high ability to change set and a tendency to avoid stereotype in solving problems.

Based on these eonstructs, Harvey has developed the "This I Believe" Test (TIB) whieh is designed to measure the individual's conceptual systems. In addition, Harvey and his assoeiates (Harvey, 1970b) have developed a Student Self-Coneeption Test which is designed for the same purpose and have obtained four faetors whieh appear to be the behavioral correlates of the four major coneeptual systems. These tests are deseribed in detail in Chapter III.

Signifieance of the Study

The present study is signifieant in its attempt to fill the gaps left by earlier researeh, in its building upon the foundations provided by reeent researeh, and in its implieations for teacher and administrator training, school improvement and for further researeh.

First, there is considerable evidence to show the impaet of early environment on the development of human eharaeteristies, yet, as Sinelair (1971) has indieated, little attention has been given to the identification of environmental variables that aetually exist in schools. The minimal references to elassroom environment in the most reeent edition of the Encyelopedia of Edueational Researeh (Ebel, 1969) lends further support to Sinelair's assertion. Similarly, although the individual's pereeption of his environment strongly influences his behavior, most assessments of edueational environments have not utilized student perceptions.

The present study uses the theoretieal framework provided by the work of Henry Murray (1938), and the empirieal research of Bloom (1964), Wolf

(1963), Dave (1963), Pace (1963), Sinclair (1968), and others as a basis for measuring elementary school classroom environments as perceived by children. Thus, it provides further information concerning the environmental variables that exist in classrooms and further information regarding student perceptions of the classroom. This is significant for a number of reasons. First, because of the importance of early environment in the development of human characteristics. Second, because schools should be primarily for children and, thus, we need to know how the child views the environment provided for him. Third, because student perceptions of the environment play a major role in determining their behavior. Finally, because of the relatively few studies that have been done using student perceptions of the classroom environment.

Second, Getzels and Jackson (1963) pointed out three specific limitations of earlier studies concerning teacher personality: the failure to extend the examination of teacher cognitive functioning beyond a measurement of intelligence and verbal understanding, the absence of theoretical grounding for most of the studies, and the tendency to rely on a single criterion of teacher effectiveness. The work of Harvey (1966, 1968, 1970b), Hunt (1966, 1967, 1971), and Joyce (1967, 1972) in recent years has begun to meet some of the needs defined by Getzels and Jackson. The present study takes on significance by building upon the work of Harvey, Hunt, and Joyce, and, in so doing, utilizing a theoretical network, Conceptual Systems theory, to examine teacher personality. Also, in focusing on teacher conceptual systems, it emphasizes cognitive

structure and content, not intelligence or verbal ability. In addition, by looking at teacher abilities to radiate a wide variety of environments, it attempts to overcome the single criterion limitation.

Equally important, the work of Hunt and Joyce has utilized a relatively narrow definition of environment and has failed to employ the perceptions of students. To create schools with a wide array of environments, there is a need to have teachers who can help create environments that are not purely a function of instructional form. Hunt and Joyce tend to equate environment with instructional form; the present study (see p. 4) uses a broader definition of environment. To measure these environments we need the perceptions of the learners who are most affected by them. Thus, the present study is significant in utilizing student perceptions to measure a variety of environmental variables which are not likely to be purely a function of instructional form.

Third, the work that has been done by Harvey (1970b), Hunt (1971), and Tuckman (1968), suggests that similarity and dissimilarity between teacher and student conceptual systems may have a considerable influence on student perceptions of the environment. This study is significant in building upon the work of Harvey, Hunt, and Tuckman and, thus, adding to the available fund of knowledge concerning this relationship.

Fourth, classrooms are needed in which the diverse needs of individual children are met. To reach this goal we need pluralistic schools and classrooms. Research, however, often uses the monolithic school and the monolithic class-

room as the basic frames of reference and often assumes, contrary to fact, that a single instructional system and single environment can provide optimal learning for all students.

The present study is also important because it provides information that will be helpful in building pluralistic schools and classrooms. More specifically, it provides data concerning the relationship between teacher conceptual systems, student conceptual systems, and classroom educational environment which can be used in matching students, teachers, and environments and in teacher selection, teacher training, and curriculum building for pluralistic schools.

Further significance of the present study lies in the instrumentation. The Elementary School Environment Survey (ESES) has proven successful in measuring student perceptions of elementary school environments and in differentiating between schools. A successful adaptation of the instrument for classroom use is significant in view of the general absence of effective instruments for measuring student perceptions of the classroom educational environment. The "This I Believe" Test has proven useful in measuring teacher conceptual systems and further use of the instrument in a different research design should suggest possible additional applications. The Student Self-Conception Test, although already utilized effectively by its developers (Harvey, 1970b), is still essentially "unproven." Further testing should help refine the instrument and establish it as a practically useful one for teachers, administrators, and researchers. The combination of these instruments provides a set or package

of assessment procedures which should prove valuable for educators in their efforts to match students, teachers, and environments.

Finally, the present study is of value because it advances a number of hypotheses concerning relationships between teacher conceptual systems, student conceptual systems, and classroom environment which should prove useful as a foundation for experimental research investigating the nature of cause and effect relationships between the three variables.

Delimitations of the Study

The findings in the present study are considered to be of an exploratory nature and are looked upon as data which will suggest further areas of experimental research. The data should be treated with a level of confidence commensurate with the design and its delimitations should be taken into consideration. As Guba (1961, p. 2) indicated:

> You should be aware of the possible sources of error to which your design exposes you. No one can expect that you will in every situation produce a perfect, errorless design. However, you can be expected to be aware of the possible sources of error and to do what you can to overcome them or to take them into account in your interpretation. To demonstrate this awareness, you should yourself point out the sources of error. . .

Accepting Guba's guidelines, the delimitations of the present study are presented as follows:

1. Theoretical Delimitations - The review of the literature concerning Conceptual Systems theory (see Chapter II) suggests its considerable value.

At the same time, some cautions are in order.

The first delimitation of Conceptual Systems theory concerns the developmental aspects. Kogan (1971, p. 278) notes that it is possible that we have been given a theory of personality and cognition stated in developmental terms "rather than a developmental theory in its own right." Similarly, Hunt (1971, p. 36) indicates that, "the developmental rationale in the CL model is only an assumption, with virtually no longtitudinal support; therefore, it should be regarded as a helpful metaphor which may or may not be valid."

Second, it is still unclear whether the instruments developed by Harvey, Hunt and Schroder measure the structural variable of integrative complexity or primarily measure personal and social content (Kogan, p. 278). Thus, the present study makes no claim that teachers' cognitive structures are being directly measured.

2. Instrumentation Delimitations - The ESES has not been used previously for classroom measurement. Although the changes for the purpose of the present study are minimal, and although some assessments of reliability and validity are made, the limited sampling suggests that the findings should be viewed with reservations until further studies are made.

The Student Self-Conception Test is relatively new and the data available concerning its reliability and validity is minimal. Thus, the findings related to that instrument must be seen as limited in generalizability.

3. Cause-Effect Relationships - The present study does not determine the nature of causality between the three major variables. Although the study provides information which, in conjunction with the results of earlier studies, increases the probability of predicting causality accurately, further experimental studies will be necessary to help determine cause-effect relationships.

4. Generalizability - Generalization of the findings in the present study are necessarily qualified by the following:

a) The schools selected for the sample are all public institutions and no attempt is made to include private schools in the sample.

b) The sample of classrooms is drawn solely from the Western Massachusetts area.

Approach of the Study

The approach of the present study takes the following directions. First, hypotheses are formulated through an examination of both theory and empirical research which are relevant to the current investigation, and through a process of logical deduction. These hypotheses are:

H_1: There will be significantly higher scores for Involvement in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_2: There will be significantly higher scores for Autonomy in the classroom educational environ-

ment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_3: There will be a significantly higher number of total positive responses across environmental variables in the classrooms of System IV teachers than in the classrooms of System I, System II, and System III teachers.

H_4: There will be a significantly higher number of total positive responses across environmental variables by those students whose conceptual systems are similar to their teacher's than by those students whose conceptual systems are dissimilar to their teacher's.

The sample of fifty-two teachers and 1180 students in their fifth and sixth grade classes is then selected from elementary schools in Western Massachusetts. School districts are identified through random sampling procedures and individual schools within the districts are selected to provide a sample representing diverse population clusters, settings, and demographic conditions so that a characterization can be made of the larger elementary school population. The instruments are administered in twelve elementary schools providing variations in numbers of students, ethnic characteristics of students, school size, per-pupil expenditure, and family socio-economic status.

Three instruments are employed: the Elementary School Environment Survey (ESES), the "This I Believe" Test (TIB), and the Student Self-Conception Test (SSCT). The ESES, administered to students, is a forty-two item survey of conditions, behaviors, or feelings about the educational environment.

Students are requested to respond by marking either True or False for each statement. The present study utilizes the ESES, with minor changes designed to adapt it for use in measuring classroom educational environments.

Reliability and validity of the instrument are estimated on the basis of a review of earlier studies and the history of the development of the instrument. In addition, reactions and comments of pupils regarding specific items are examined and the items are systematically studied by the investigator to determine if they represent characteristics of the defined environmental variables. Further evidence concerning validity is sought through a factor analysis of the items, while additional evidence concerning reliability is obtained by collapsing data across classes and using Kuder-Richardson formula 20.

The "This I Believe" Test (TIB), administered to teachers, is a sentence completion test which measures conceptual systems. The subject is required to indicate his or her beliefs about a number of socially and personally relevant concept referents by completing in two or three sentences the phrase "This I believe about _____." The blank is replaced successively by a number of referents such as "religion," "friendship," and "the American way of life." Reliability tests of the instrument have produced high scores and the test has been shown to have concurrent validity.

The Student Self-Conception Test (SSCT), administered to students, is an objective test which measures student conceptual systems. The students are asked to respond by marking True or False for each of the statements which

describe how they may think, feel, or act while in class. Further evidence concerning construct validity is sought through factor analysis procedures and additional evidence concerning reliability is obtained through a generalized split-half reliability test of each of the four variables.

The data from all three instruments are prepared for analysis. The first two hypotheses are then tested by employing an F-test to determine if significant differences exist between the classrooms of teachers with differing conceptual systems for each of the environmental variables. Where significant differences are discovered, the Neuman-Keuls procedure is then employed to determine the specific differences, and an omega value squared (ω^2) procedure is employed to determine the degree of association between the variables. The third hypothesis is tested by using the same procedure to determine whether differences of significant magnitude exist between teachers of differing conceptual systems along the dimension of total positive responses on the ESES.

Scores from the SSCT and TIB are then analyzed to differentiate students whose conceptual systems are similar to and different from their teacher's. The ESES scores of the two groups are compared, using an F-test. This helps determine whether students who are similar to the teacher in conceptual system perceive the classroom educational environment more positively than those students who are dissimilar, thus testing the fourth hypothesis. Also, where significant differences are discovered for specific environmental variables a ω^2 procedure is used to determine the degree to which the differences are

associated with the match or mismatch of student and teacher.

The following chapters will report the conduction of the present study. Chapter II presents the theoretical and empirical foundations for the study and describes the formulation of hypotheses. In Chapter III the research methodology is described. The selection of the sample, the procedures for collecting and reporting the data, and the instruments employed are presented in detail. The final two chapters report, analyze, and interpret the findings, and outline the conclusions and implications for teacher and administrator training, school improvement, and further research.

CHAPTER II

THEORETICAL AND EMPIRICAL FOUNDATIONS

The major purpose of this chapter is to review theoretical approaches and empirical research which are relevant to the current investigation and to generate hypotheses. Initially, the theoretical, empirical, and practical referents for the study are presented. Hypotheses are then developed by examining theoretical formulations and empirical findings that specifically relate to the present study and by a process of logical deduction.

Review of the Literature

This section presents the referents for each of the major variables in the present study: classroom educational environment, teacher conceptual systems, and student conceptual systems.

I. Classroom Educational Environment

The nature-nurture dispute seems to be an eternal one, with fluctuation in public attention to the issue seemingly determined by the periodic release of major theoretical or empirical works on the subject. The issue has again

beeome a compelling one through the publication of B. F. Skinner's Beyond Freedom and Dignity, with its strong emphasis on nurture, and Jacques Monod's Chanee and Necessity, with its emphasis on genetic determinism. Still, there has been little dispute that whatever man's genetie endowment and physiological potential, the environment plays a signifieant role in shaping his behavior and in determining what will be done with his potential. This role has been attested to by a wide range of edueators eoncerned with the environment, ineluding Murray (1938), Anastasi (1958), Paee (1963), Stern (1963), and Bloom (1964). Given the large amount of time that ehildren spend in the elassroom, it seems logical to assume that the elassroom environment is an important factor in determining the ehild's behavior and development.

Thus, the review of the literature examines the following referents for the present study:

A. A theoretieal referent supporting the use of perception to measure environments.

B. An empirieal referent concerning the effeets of early environment on human development.

C. An empirical referent determining the specific environmental variables to be measured.

D. A praetieal referent (Schwab, 1970) giving meaning to the importance of educational environment in the proeess of sehooling.

A. Theoretical Referent.- This referent centers on the use of perceptions to measure environment.

The theoretical approach to environment in the present study compliments researeh which is based on the work of Henry Murray as originally set forth in Explorations in Personality (1938). In constructing his theory of personality, Murray identified two primary influences on human behavior, need and press, which combine to form a "dynamical structure." Need, as defined by Murray (pp. 115-122), refers to a hypothetical force within an individual which determines his movements toward or away from stimulus situations. Press is essentially the stimulus situation within the total environment to which the individual both attends and reaets and is defined as an aspect of the total environment which helps or hinders the goal-oriented behavior of the individual. Thus it may be classified as either positive or negative, depending on the needs of the individual.

The same environment will, therefore, be perceived differently by individuals with different needs. There is a close relationship between the individual and his environment and the individual's behavior is determined by the dynamic interaction between his unique needs and the environmental press.

The phenomenon of environmental press is classified by Murray into two categories, Alpha press and Beta press. Alpha press is the press that actually exists, as far as scientific inquiry can determine it. Beta press is defined as the subjeet's own interpretation of the phenomenon that he perceives. The significance of distinguishing between the two is that measurement of the Alpha

press can produce a vastly different description of the environment than an assessment of the Beta press. Thus, there can be a significant difference between the analysis of the environment by an "outside" observer and the participating individual's perceptions of that environment.

The present study, based on Murray's work, uses the concept of Beta press. Although it is undoubtedly true that Alpha press and Beta press each have particular advantages, a number of factors contributed to the selection of Beta press.

First, if it is assumed that our primary concern in education is, or should be, the children, it is absurd to give their perceptions of the classroom educational environment anything less than major priority. Second, if a primary goal is to help change student behavior, given the evidence that the individual's perceptions of his environment is a major determiner of his behavior (Murray, 1938), it is important that educators be cognizant of these perceptions. Finally, there are relatively few assessments of the classroom environment which have been made using Beta press. The most noted methods for measuring classroom environments, those of Withall (1949), Flanders (1965), and Medley and Mitzel (1958), use Alpha press. Most of the assessment of classrooms and schools by accreditation groups and visiting consultants provides Alpha press feedback to schools.

In summary, it would appear that there is considerable value in using Beta press to assess the classroom environment, and that approach was there-

fore chosen for the present study.

B. Empirical Referent: Early Environment.- This referent centers on the effects of early environment on human development.

The work of Benjamin Bloom (1964) has made a major contribution to our understanding of the relationship of early environments and the development of children. As such, his work is one of the major referents for the present study.

Bloom's primary task was to identify degrees of stability and change in the individual's characteristics at different stages in his development. To define stable characteristics he used three major theoretical criteria. First, according to Bloom, stable characteristics are non-reversible. Once an increment of development is added it will not be lost. Second, the greatest amount of developmental change takes place in the early years, after which characteristics stabilize. Finally, basic mechanisms and processes are more likely to be stable than superficial aspects of the individual's behavior.

Examining and interpreting the findings of a variety of longitudinal studies, Bloom then attempted to identify critical stages in the development of various characteristics and to determine the key factors which affected this development. A number of his findings are particularly relevant to the present study.

Bloom found that the results on general achievement, reading comprehension, and vocabulary development indicated that most of the general achieve-

ment pattern of the 18 year old had been developed by the age of 12 (p. 105). Based on these and other findings, Bloom (p. 229) reported that the evidence suggests that "early environment is likely to be the significant one for the development of many of these characteristics."

Equally important, Bloom (p. 187) reported that the environment provides a network of forces and factors which surround and engulf the individual, and he wrote:

> Although some individuals may resist this network, it will only be the extreme and rare individuals who can completely avoid or escape from these forces. The environment is a shaping and reinforcing force which acts upon the individual.

Bloom (p. 223) concluded that much of the stability which he reported was "really a reflection of environmental stability" and could be explained by the constancy of the individual's environment over time.

Although Bloom's focus is on home environments and the total environment, many of the characteristics which he emphasizes, such as intelligence, achievement, and personality, are major concerns of schools. In addition, his findings concerning the importance of early environments in affecting human development give additional impetus and importance to the investigation of elementary school environments.

Bloom's work has received additional support in empirical research concerning the effects of early environment on the individual characteristics of intelligence and achievement. These two characteristics are chosen because

they appear to be significant in children's development and because they include behaviors which are subject to modification in school. Affective behavior is not considered because of the lack of evidence indicating that personality characteristics stabilize during the elementary school years.

Separate studies by Hill and Grammatteo (1963) and by Shaw (1943) have provided evidence that there is a correlation between socio-economic background and achievement. Hill and Grammatteo investigated the relationship of socio-economic status to vocabulary achievement, reading comprehension, arithmetic skills, and problem solving. Using interviews to determine the socio-economic status of the selected third graders, and administering a variety of achievement tests, they found a significant positive correlation between high socio-economic status and success in academic achievement.

Shaw's study, focusing on a group of fourth through eighth grade students, used the Stanford achievement test to obtain achievement data. His findings showed a significant positive relationship between high income and achievement scores and suggested a substantial relationship between socio-economic status and achievement.

The powerful effect of the home environment on children's achievement has been notably supported by the findings of Newman, Freeman, and Holzinger (1937). Studying pairs of identical twins who had been separated in early childhood, they rated a number of individual characteristics and rated environments with respect to educational, social, physical and health conditions. They found

a high correlation (+.91) between educational environment and school achievement. Identifying relevant aspects of home conditions, they found a strong correlation between environment and achievement.

The most comprehensive investigation of the influence of environment on achievement was conducted by Dave (1963). After an extensive review of existing research, he identified twenty-two environmental variables which affected achievement. Using empirical procedures, including parental interviews, and a variety of achievement tests, he found an overall correlation of +.80 between environmental variables and the achievement battery.

Taken together, these selected environmental studies provide considerable evidence of the positive relationship between environment and achievement. There is a similar body of evidence showing a positive relationship between environment and intelligence.

Newman, Freeman, and Holzinger (1937), also found evidence to show that environment is a major determiner of intelligence. In their examination of the characteristics of twins raised in different environments, the researchers found a significant positive correlation (+.79) of social, educational, physical and health aspects of the environment with intelligence scores. Although these findings have been accepted by many educators, they have been challenged by the recent work of Arthur Jensen.

In his controversial article in the Harvard Educational Review (1969), Jensen cited studies performed with adopted children, twins, and family members,

and argued that heredity, not environment, is the chief determiner of intelligence. Synthesizing the results of major studies on the subject, Jensen indicated that from seventy to ninety per cent of intelligence is determined by heredity. Jensen does see environment as playing some role, but believes that while deprived environment may retard natural intellectual growth, an enriched environment has little effect upon intellectual growth.

Benjamin Bloom (1969) responded critically to Jensen's article and cited research which supports the proposition that environment is a major factor in determing intelligence. His major evidence, drawn from studies of the Israeli kibbutz, showed that in the enriched environment of the kibbutz, the average I.Q. of Oriental Jews was increased by 30 points, thus matching the I.Q. of the European Jews. Bloom (p. 421) went on to indicate that even if heredity was important in influencing intelligence, the educator must be an environmentalist.

> It is through environment that he must fashion the educational process. If heredity imposes limits, so be it. The educator must work with what is left. . . The improvement of education and other environments is really the only means available to a civilized society for the improvement of the lot and fate of man.

Although there is disagreement concerning the relative importance of the two factors, there is agreement among researchers that both heredity and environment play a role in the development of intelligence. There is also agreement that a deprived institutional environment can inhibit the growth of intelligence as has been shown in studies by Wellman and Skeels (1938), Kirk (1958), and Murphy (1968).

One of the most comprehensive examinations of the relationship between intelligenee and environment was conducted by Wolf (1963). Using a detailed review of past research as a basis, Wolf identified thirteen process variables eoncerned with the environment which he believed to be related to intelligence. To empirieally test the effectiveness of these variables he gave I.Q. tests to sixty fifth grade children and interviewed their mothers to gain information coneerning the thirteen environmental variables. The I.Q. scores and the environment ratings had a significant positive relationship (+.76).

It is possible to conclude, therefore, that there is a relationship between environment and intelligenee and that, at the least, deprived environments seem to retard the growth of intelligence. In broader terms, there is considerable evidence that environment has an effect on the development of both intelligence and aehievement in human beings, and that the early years are most important in this development. Thus, the examination of elementary school educational environments appears to be a virtual necessity.

In the light of this, Sinclair (1968) developed his instrument for measuring elementary sehool educational environments, building closely upon the work of Wolf and Dave, and upon Pace's (1963) work in measuring college environments.

C. Empirical Referent: Specific Environmental Variables.- This referent centers on the determination of the speeifie environmental variables to be measured in the present study.

In his study of the relationship between environment and intelligence, Wolf (1963), as noted earlier, identified thirteen major environmental variables. He divided these variables into three categories, and these categories and their descriptions were adapted by Sinclair (1968, pp. 22-23), as follows:

> 1. Achievement motivation - The nature of the intellectual expectations of the child and aspirations for the child contribute to this press. Further, the amount of information about a child's intellectual development. and the nature of rewards for intellectual accomplishment play a part in this dimension.
>
> 2. Language Development - This environmental antecedent is characterized by opportunities that encourage the use of language. The development of language is fostered by attention to opportunities for increasing vocabulary and for using verbal ability in a variety of situations. Also, the emphasis on correctness of language usage and the quality of language models available to the student contribute to this variable.
>
> 3. General Learning - This environmental dimension is best described as having an emphasis on providing opportunities for learning in the school and outside the school. The atmosphere encourages direct contact and interaction with the surrounding world and with experiences represented by books, periodicals, pictures, and other such media. Not only are students encouraged to use library facilities and learning supplies, but there is a concentrated effort on having such things available. Finally, this variable can be characterized by the nature and amount of assistance provided to facilitate learning in a variety of situations.

Similarly, Dave (1963), in his study of the relationship between environment and achievement, identified twenty-two environmental variables which he classified into six categories. These categories were adapted by Sinclair (1968, pp. 23-25) in the following manner:

1. Achievement Press - Teacher aspirations for the education of the student, and the teacher's own aspirations and interests in academic achievement contribute to the achievement press. The social emphasis for academic achievement and the standards of reward for educational attainment also are part of this variable. Further characterization of this dimension includes the concern for knowledge of the educational progress of the child, and the preparation and planning for the attainment of educational goals.

2. Language Models - The quality of the language usage of the teachers, the opportunities for the enlargement and use of vocabulary and sentence patterns, and the alertness of the teacher for correct and effective usage contribute to the environment that stresses language.

3. Academic Guidance - The availability and quality of guidance on matters relevant to school work, and the availability and use of materials and facilities related to school learning are important to this environment.

4. Activeness of the School - This environmental variable is best described by the extent and content of indoor and outdoor activities of the school. An emphasis on the use of television, films, books, periodical literature, and other facilities of the library is also apparent.

5. Intellectuality in the School - The nature and quality of toys, games, and hobbies made available to the child, and the opportunities for thinking and imagination in daily activities are characteristics of this environment.

6. Work Habits in the School - This environmental dimension includes the degree of structure and routine in the school and classroom management. The amount of preference for educational activities over other pleasurable encounters is another element of this environment.

The most direct influence on Sinclair in the development of his Elementary School Environment Survey was the work of Robert Pace (1963). In his studies of college and university environments, Pace (pp. 24-25) found that these institutions were significantly different from one another when measured in terms of environmental variables which he labeled Practicality, Community, Awareness, Propriety, and Scholarship.

Sinclair (pp. 25-30) found these five variables to be empirically related to the environmental variables identified by Dave and Wolf in relationship to intelligence and achievement and they were further refined by Sinclair and Sadker (1971) in their measurement of elementary school environments to include six new variables: Alienation, Humanism, Autonomy, Morale, Opportunism, and Resources. The relationship of these variables to the Wolf and Dave variables is made evident in the two dimensional paradigm in Figure 1.

The paradigm, based on a process of logical deduction, shows that the six variables identified by Sinclair and Sadker are appropriate dimensions for differentiating among schools and are also related to environmental counterparts affecting achievement and intelligence characteristics. Because of their significance and appropriateness, these variables are used in the present investigation of elementary school classroom environments.

In summary, there is evidence that environment influences the development of human characteristics and that the elementary school years are particularly important for this development. Also, there is evidence from the

Figure 1

Paradigm of Environmental Variables

Stable Characteristics	Environmental Counterparts	Sinclair and Sadker Variables					
		Alien.	Hum.	Auton.	Morale	Opptsm.	Res.
INTELLIGENCE	1. Achievement Motivation	*	*	*	*	*	*
	2. Language Development		*	*			*
	3. General Learning	*	*	*	*	*	**
ACHIEVEMENT	4. Achievement Press	*	*	*	*	*	**
	5. Language Models		*				*
	6. Academic Guidance	*	*		*	*	
	7. Activeness of the School	*		*			**
	8. Intellectuality in the School	*	**	*			**
	9. Work Habits in the School	*		**	**		

* - Indicates relationship
** - Indicates close relationship

work of Sinclair and his associates, building on the theoretical and empirical referents discussed earlier, that the ESES measures environmental variables which differentiate significantly among elementary schools and which are likely to influence the development of human characteristics. Sinclair's work has focused on total school educational environments and the present study assumes that there is good reason to expect that the classroom will include the same basic environmental variables.

With the empirical bases for the environmental variables now delineated, it is important that the major practical referent be examined.

D. Practical Referent. - In The Practical: A Language for Curriculum, Schwab (1970) outlines a prescription for educational change based on the practical observation of "identified frictions and failures in the machine" and on the "anticipatory generation of alternatives" (pp. 31-33). Schwab views this approach as a viable alternative to the theoretical approaches frequently utilized. The work of Bruce Joyce utilizes a practical approach and gives meaning to the importance of educational environment in the process of schooling. Thus, it is a practical referent for the present study.

Joyce (1972a, pp. 176-177) views our present schools as "monolithic" institutions which specialize in "technical education" and prepare students for places within the present status-economic system. Thus, he calls for (p. 179) humanistic curriculum workers to free themselves from the limitations of this "monolithic" system and to develop instead a "pluralistic education - the

educational aspects of a pluralistic society." Developing this further, Joyce (p. 179) writes:

> What we need to erect are sets of engineering propositions which can be used to bring about a wide variety of educational environments, including the institutional forms which can nourish them.

Based on this goal, Joyce visualizes a school in which there are a variety of educational programs designed to further a variety of educational missions rather than the present mission of helping the individual to ascend and survive in the technical-economic system. The primary task in selecting these educational missions (p. 180) is to "identify the domains through which the program will enter the life of the learner in order to change his responses to living in the world. The pluralistic education should represent many domains of possible development."

Joyce (p. 181) then outlines three domains:

1. We can attempt to improve the capacity of the learner through direct intervention in the personal domain (as through a direct attempt to improve his intelligence or to give him greater control over directing his own destiny);

2. We can attempt to enter the social domain, to assist him at a point where he is interacting with his fellow man (as when we attempt to teach him social or economic skills); or

3. We can attempt to reach him through the academic domain, by teaching him academic skills and ways

> of dealing intellectually with complexity (as when we attempt to teach him the social sciences). *

Using these domains to help sort out some of the possible missions of education, Joyce indicates that we must next determine what kinds of environments are likely to promote development in the specific domains. Here he identifies four major types of environments (p. 181): personalistic, environments which help the individual to create his reality and his world view; interactive, environments which facilitate group processes; informational, environments which improve our symbolic capacity to process information; behavior shaping, environments which are designed to maniuplate and shape external behavior.

Finally, Joyce (p. 187) offers one possible method of relating missions, domains, and environments, through the creation of three curriculum modes:

1. The cybernetic mode - This mode is characterized by pre-planned, largely automated materials, utilizing self-instruction by individuals or groups for whom instructional activities have been prescribed, and an automated assessment system that feeds back progress reports to the student.

2. The tutorial mode - This mode utilizes individual counseling to help the learner structure his own goals and activities.

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*In other sections of the work cited and in his other writings (Joyce, 1968; Joyce and Weil, 1972a) Joyce provides examples for each of these domains which include such approaches as: awareness training, creative reasoning, and conceptual systems matching models. Thus, his full vision extends well beyond the rather traditional normative examples cited above. Further possibilities related to this approach have been suggested by Fantini and Weinstein (1968). Building upon Joyce's framework, Fantini and Weinstein developed a framework for a "three tier school" in which Tier 1 focuses on the academic domain and Tiers 2 and 3 on the personal and social domains.

3. The group inquiry mode - In this mode groups analyze problems, explore social values, and try on ideas from the different disciplines. The interpersonal processes of the group are also included as subjects for study.

Summarizing his goals and his conceptual framework, Joyce (pp. 186-187) writes:

> It is the creation of pluralistic educational environments that is our business. We need the ability to specify alternative missions, to create the environments that will accomplish these missions, and to carry out the engineering necessary to create the material, the social system, and the instructional system that will activate them.

The result will be a variety of educational environments, each serving students in a different way.

Thus, Joyce suggests that in order to create a more pluralistic society and to move children toward more possible paths of living, we need pluralistic schools and classrooms, with multiple missions and a variety of environments. He offers one possible route to developing such schools.

Accepting Joyce's practical framework and basic goals, the present study seeks to contribute to their attainment. To create the environments Joyce delineates requires skills of design and implementation. It also requires further knowledge regarding the nature of educational environments and further knowledge regarding the teacher characteristics needed to create and/or perpetuate these environments.

Proceeding toward this end, the environments and modes described by Joyce seem similar in a number of ways to the variables identified by Sinclair

and Sadker in their studies of elementary school educational environments. The four environments and three modes of Joyce, which overlap to some extent, and the six Sinclair and Sadker variables can be related in a two dimensional matrix (see Figure 2). The asterisks indicate those places where Joyce's environments and modes appear to correspond to or complement the selected environmental variables.

Figure 2

Paradigm of ESES Variables and Joyce's Enviroments and Modes

Joyce's Environments and Modes	ESES Variables					
	Alien.	Hum.	Auton.	Morale	Opptsm.	Res.
Personalistic	**	**	**	Impt.	Impt.	
Interactive	**	**		in	in	
Informational		**		all	all	**
Behavior Shaping				cases ↓	cases ↓	**
Cybernetic			**	↓	↓	**
Tutorial			**	↓	↓	
Group Inquiry	**	**		↓	↓	

This matrix suggests that each of Joyce's environments and modes relates in some way to one or more of the Sinclair-Sadker ESES variables. It seems likely, therefore, that further inquiry into the relationship between these

variables and teacher characteristics can contribute to the realization of Joyce's pluralistic schools.

Having examined theoretical, empirical, and practical referents for the approach to environment in the present study, the study now turns to the second major variable, teacher conceptual systems.

II. Teacher Conceptual Systems

Given the need to create multiple environments which are likely to meet the diverse needs of children, it is important that we increase our knowledge concerning the relationship between teacher characteristics and classroom educational environments. Also, if we are to create pluralistic environments, we must identify those specific teacher characteristics which are most likely to help create and/or perpetuate specific types of environments. Thus, the review of the literature examines the following referents for the present study:

A. An empirical referent concerning the relationship between teacher personality characteristics and classroom educational environments.

B. A theoretical referent supporting the investigation of conceptual system as a significant personality characteristic.

C. An empirical referent concerning the relationships between teacher conceptual systems and classroom environment.

A. Empirical Referent: Teacher Personality Characteristics. - Although it is logically assumed that teachers are a significant factor in determining classroom environments, it is important that funded knowledge be examined to determine the empirical support for this assumption. Thus, this referent centers on the relationship between teacher personality characteristics and classroom educational environment.

Three separate studies, by Medley (1961), Fowler (1962), and Walberg (1968), have reported evidence to support the assumption that teacher personality is an important variable in the classroom. Medley (1961) used the Edwards Personal Preference Schedule to measure teacher personality and used pupil reactions to measure teacher-pupil rapport. He found significant correlations between teachers judged highest in teacher-pupil rapport and a number of teacher personality characteristics. Fowler (1962) employed a number of different measures of teacher personality, including the Minnesota Multiphasic Personality Inventory, and found positive correlations between specific variables as measured by these instruments, and teacher behavior, student behavior, and classroom emotional climate. Walberg (1968) administered a battery of personality and attitude tests to a group of thirty-six male Physics teachers and administered a Classroom Climate Inventory to their students. He found significant relationships between teacher needs and the climates of their classrooms.

These studies, however, have provided limited data regarding the relationship between teacher personality characteristics and classroom environments and more work is needed. Getzels and Jackson (1963), in their comprehensive review of research on teacher personality characteristics, stated the need for research leading to the "discovery of specific and distinctive features of teacher personality" (p. 574). At the same time, they noted a number of serious limitations of earlier research which are important in relation to the present study.

First, they noted (p. 574) that most of the research concerned with the cognitive abilities of teachers has focused on intelligence and verbal understanding and indicated that "the role played by different types of abilities (e.g., divergent thinking) and by attitudinal correlates of ability has yet to be fully explored." Secondly, they pointed out (p. 575) that a major limitation of earlier studies investigating teacher personality was that they were conducted in a "theoretical vacuum." Finally, they indicated that the studies have also been limited by the tendency to rely on a single criterion of teacher effectiveness.

The work of Hunt, Joyce, and Harvey in recent years has utilized a theoretical base in examining teachers' cognitive structures and, thus, has begun to meet some of the needs specified by Getzels and Jackson. Mindful of the Getzels and Jackson findings, the present study is based primarily on the work of Hunt, Joyce, and Harvey. Thus, both the theoretical framework

for this work and the related empirical research are presented in the following sections.

B. Theoretical Referent: Conceptual Systems. - This referent centers on theoretical support for the investigation of conceptual systems as a significant personality characteristic.

The theoretical approach to teacher personality characteristics in the present study is related to research based on the work of Harvey, Hunt, and Schroder as originally set forth in Conceptual Systems and Personality Organization (1961), and as summarized by Hunt in Matching Models in Education (1971). A conceptual system, according to the authors (Hunt, p. 18), characterizes the organizational structure through which the individual processes information and reads events. It is not concerned with the content of information but with how the information is processed. Systems also contain an important interpersonal component in that they characterize how the individual conceptualizes himself, others, and the relationship between himself and others.

As Hunt summarizes (p. 18):

> Systems vary, from a form in which both self and others are undifferentiated parts of the generalized standard, to a structure in which the self is part of highly differentiated others, all of which are integrated into a whole. The dimensions along which the variation occurs may be considered integrative complexity, interpersonal maturity, degree of abstraction, or conceptual level. Higher conceptual level is associated with 'lower stereotypy and greater flexibility in the face of complex and changing problem situations,

> toward greater ereativity, exploration behavior, toleranee of stress, etc.'. . . In interpersonal terms, the higher eonceptual levels are associated with greater self-understanding and empathic awareness of others.

Conceptual development is conceived of as a eontinuous proeess which, ideally, evolves in a given order to the highest coneeptual level. Thus, Harvey, Hunt, and Sehroder theorize a developmental sequenee moving through four stages, in essenee, four separate eoneeptual systems.

As Hunt indieates (p. 19), eonceptual systems "vary both in terms of cognitive variables or information proeessing (degree of differentiation, integrative eomplexity), and in terms of motivation variables or inter-personal orientation (independenee-dependenee, empathie eoncern)." Thus, individuals differ both strueturally and dynamieally, and these differences lead to different motivational orientations: Stage I - unilateral dependenee, Stage II - negative independenee, Stage III - eonditional dependenee and empathy, and Stage IV - interdependenee (Hunt, p. 35).

Finally, the value base for the work of Harvey, Hunt, and Schroder (p. vi) is also relevant to the present study. Aeeording to Coneeptual Systems theory, abstract eoneeptual strueture and the assoeiated charaeteristics of creativity, flexibility, and stress tolerance is a desirable, adaptive state. This assertion arises from a coneern with the individual's ability to adapt to a changing environment. The eoneern is less with level of performanee in a relatively stable environment than with inereasing effectiveness of adaptability to ehange.

In summary, Harvey, Hunt, and Schroder have theorized a developmental sequence of conceptual systems which vary both in terms of cognitive variables and motivational variables and have assumed that the most abstract conceptual structure and its associated characteristics are most desirable because they enable the individual to adapt most readily to changing environments.

The three authors of the original work have continued their exploration of conceptual stages in recent years, but have chosen different paths. Hunt's studies have led him to exclude stages III and IV because of evidence indicating that Stage III does not necessarily develop in sequential order and because of the failure to find Stage IV individuals. Schroder's work has focused on the integrative complexity of personality structure. The research of O. J. Harvey has emphasized the motivation variables and has used content-oriented measures for classifying individuals into one of the four system categories.

Harvey's approach was chosen as the immediate base for the present study for the following reasons. First, by concentrating on both content and structure, Harvey has seemingly remained closest to the original theoretical framework. Second, there has been a greater quantity of empirical research using Harvey's approach and instruments in relationship to classroom environments and teacher characteristics. Third, Harvey's instrument is more easily administered and scored. At the same time, it is important to recognize that the theoretical base is essentially the same in all three cases, and it is that base which is used in the present study.

Utilizing that theoretical base, Harvey has concentrated his research on finding out how an individual's belief system (i.e., his deeply held attitudes and values) affects his ability to behave creatively, flexibly, and adaptively, how these belief systems come to be formed, and the ways in which they can be changed. Commenting further (1970b, pp. 10-11), he writes:

> We have examined belief systems in terms of two basic aspects, content and structure. Content includes the referents towards which one holds beliefs or attitudes, such as God, oneself, a stone, or any object of direct or indirect experience. Structure relates to how we organize our beliefs and includes such attributes as openness-closedness, consistency-inconsistency, and complexity-simplicity.

The four systems delineated by Harvey are presented in detail on pages 9 and 10 and generally move from the highly concrete and authority-centered thinking of System I to the abstract and open-minded functioning of System IV. Murphy and Brown (1970) have recently drawn upon Conceptual Systems theory and on the specific work of Harvey and have hypothesized teaching patterns that might be exhibited by teachers characterized by the different conceptual systems. These descriptions are particularly relevant to the present study and are included as follows (pp. 530-532):

> System I - These teachers are characterized by unilateral dependence and see their own statements and those of other authority sources as the highest good. Searching or seeking for unknowns by students is regarded as inappropriate and unnecessary for learning. Questions have only one answer which is "right" according to authority sources. These teachers will tend to deliver information to pupils and ask narrow questions permitting

only one "right answer. They will reward the student's ability to state definitions and facts as given by authority sources, and also reward the student's ability to conform to teacher established procedures and rules.

System II - These teachers are characterized by negative independence and tend to reject the customary social roots for self-definition and esteem. Lacking stable referents for their concepts, they are inconsistent and uncertain in their functioning. These teachers use criteria for judging adequacy of performance that are inconsistent and impulsive. Teachers functioning at this level will tend to deliver information to students, ask narrow questions, and to reward conformity to rules in much the same manner as those whose system is unilaterally dependent except that they are erratic and unpredictable in their expectations of students.

System III - These teachers are characterized by conditional dependence, have high affiliative needs and are very susceptible to group influences. They are concerned with establishing friendships, intragroup consensus, and dependency relations based on mutuality rather than on rules and authority. They are more abstract than the teachers described above and will encourage pupils to express themselves and to theorize. They will not deliver information and ask narrow questions as much as the System I teachers, will reward searching by pupils, and do less sanctioning of obedience to rules. They will also sanction pupil relations with others more than teachers functioning at other conceptual levels and will make more general supportive comments in the classroom.

System IV - These teachers are informationally interdependent, have abstract conceptual structures and are cognitively complex. They do not see themselves as an authority source for pupils. These teachers regard knowledge as tentative rather than absolute; they have a respect for doubt, an openness to new experience, and can consider situations from the pupil's point of view. Rules or standards are presented informationally rather than through arbitrary and external imposition. The informationally interdependent teacher will encourage

> pupils to test, relate, and reflect upon their own ideas and to hypothesize, synthesize, and even conjecture about content, and will ask questions accordingly. Reward will be related more to seeking by pupils than to finding solutions.

In summary, this study employs as its theoretical base the Conceptual Systems theory of Harvey, Hunt, and Schroder. It makes primary use of the particular approach taken by O. J. Harvey, focusing on both the content and structure of belief systems. Finally, it uses the four basic systems as they relate to teacher characteristics and, to this end, employs the hypothesized descriptions of Murphy and Brown.

This particular theoretical base is considered important for the present study for two major reasons. First, given the practical referent in the work of Joyce, directed toward the creation of pluralistic, multiple environment schools, it becomes important to identify teachers who can adapt to multiple environments as well as create them. With individual adaptability as a primary value base, Conceptual Systems theory meshes well with Joyce's goals. Second, given the attempt to identify relationships between environments and teacher characteristics, the fact that the separate approaches of Harvey and Hunt, using the same theoretical base, have already been used in a number of important studies concerning the relationship of teacher conceptual systems and classroom environment, provides empirical grounding relating the theory to the present study. This empirical base is examined next.

C. Empirical Referent: Conceptual Systems and Classroom Environment.- This referent centers on the relationships between teacher conceptual systems and classroom educational environment.

Although still limited in quantity, the research concerning the relationship between teacher conceptual systems and the classroom environment is meaningful.

In a number of studies Harvey and his associates have found that teachers of concrete and abstract belief systems differed markedly in the classroom environments they created for students. In the first study (Harvey, et al., 1966) they used outside observers to measure classroom environments, and found that teachers representing System IV, the most abstract belief system, and teachers representing System I, the most concrete mode of functioning, differed significantly on 14 different dimensions of classroom atmosphere.

In a follow-up study (Harvey, et al., 1968), the investigators found that the conereteness-abstractness of teachers' belief systems related to their overt resourcefulness, dictatorialness and punitiveness in the classroom. Teachers representing System IV displayed significantly greater resourcefulness and significantly lesser amounts of dictatorialiness and punitiveness in the classroom. In addition, the results of the observers' ratings indicated a significant relationship between teacher behavior and student behavior. Specifically, there was a significant positive correlation of teacher resourcefulness with student cooperation, involvement, activity, and achievement and

a significant negative correlation with the concreteness of students' responses. Teacher dictatorialness and punitiveness each related significantly negatively with student cooperation, involvement, activity, achievement, and helpfulness and significantly positively with the concreteness of students' responses.

In a more recent study, Harvey and his associates (Harvey, 1970b, p. 14) employed student ratings of teachers in order to determine whether students perceive teachers of different belief systems much as trained observers do. The answer was strongly affirmative. System IV teachers were rated highest by students in fostering cooperation, exploration, and espirit de corps. System I teachers were rated highest in fostering rigidity.

Using the Harvey Conceptual Systems Test and a classroom observation measure developed by Joyce, Murphy and Brown (1970) provided further support for the hypothesized relationship between teachers' conceptual systems and instructional behavior. They found (p. 536) significant positive relationships between high conceptual level and teacher behaviors of helping students theorize, helping students toward self-expression, questioning for precise answers, sanctioning group relations, sanctioning search behavior, and sanctioning attainment. Equally important, Murphy and Brown, like Harvey and his associates, found (p. 533) that more than fifty per cent of the teachers could be classified as System I, less than ten per cent as System IV, and none as System II.

Hunt and Joyce (1967) sought further data concerning the ability of

teachers to exhibit a wide variety of teaching styles and began with the assumption that "the capacity to radiate a reflective educational environment also probably indicates a general tendency to radiate a wider variety of educational environments (p. 254). They found (p. 257) a significant positive relationship between the conceptual levels of teacher trainees, as measured on a sentence completion instrument, and the use of the reflective teaching pattern, as measured by outside observers. Considering this finding along with earlier findings of Joyce, they indicate that the results "seem to provide fairly good evidence in support of the hypothesized relationship between teacher personality and teaching pattern."

At the same time, Hunt and Joyce reiterate an earlier caution (Hunt, 1966, p. 153) that:

> It is tempting to conclude from this trainee personality-preferred style relation that more abstract trainees (high CL) have more potential but, while this may be so, it is nonetheless true that it may be as difficult to make structured environment radiation available to abstract (high CL) trainees as it is to induce the availability of more reflective environmental radiation in concrete (low CL) trainees.

The results of these separate studies are important in themselves. They are also directly relevant to the present study in a number of ways.

First, they provide further support for the hypothesized relationship between teacher personality characteristics and the classroom educational environment.

Seeond, by focusing on teacher conceptual systems, by using a well-developed theoretieal network, Conceptual Systems theory, and by examining the eapaeity of teachers to radiate a variety of environments and thus avoiding the single criterion limitation, the approach begins to fill some of the gaps in research cited by Getzels and Jaekson (1963). The present study utilizes a similar approach.

Third, they provide data which is potentially of great value in attempting to develop multiple environment elassrooms and schools, in terms of both the possible matches of teaehers and environments and in terms of identifying and/or training teaehers who will be able to create and perpetuate a variety of edueational environments. This is a major concern of the present study.

Finally, as will be delineated fully in the latter part of this ehapter, these studies suggest potentially important relationships may exist between teaeher conceptual systems and the environmental variables selected for examination in the present study.

Equally important in relation to the present study, the work of Hunt, Joyce, and Harvey has left gaps which remain to be filled. First, Hunt and Joyee's study (1967) provided very limited support for the assumption that teaehers with higher coneeptual levels will radiate a wider variety of environments, a limitation whieh they noted. The present study seeks to provide further data eoncerning that assumption by investigating the relationship between conceptual systems and a variety of environmental variables.

Second, although Joyce and Hunt are concerned with environment in the broad sense, they tend to equate environment with teacher instructional behavior (Hunt, 1971, p. 52) and thus limit their vision and their measurement. If we are to have pluralistic schools with a variety of environments, there is a need to have teachers who not only "radiate" a variety of instructional behaviors, but who can also alter the broader social, physical, and intellectual determinants of behavior. Thus attention must not only be given to reflective teaching style, as one example, but to the way in which the teacher structures classroom groups, sequences learning opportunities, arranges seating, and so forth.

Finally, although they recognize the importance of perceived environments, Hunt and Joyce focus (1967) on an "objective" measurement of the environment by outside observers. Student perceptions are not utilized.

By employing an instrument which uses student perceptions to measure a variety of environmental variables, in addition to measures of teacher conceptual systems, this study seeks to build upon the work of Harvey, Hunt, and Joyce, and, at the same time, to help fill some of the remaining gaps in research.

Having examined the referents for the first two variables, the study now turns to the third major variable, student conceptual systems.

III. Student Conceptual System

The third major variable in the present study is student conceptual systems. The theoretical base for this variable lies in the Conceptual Systems

theory described in the last section. This review of the literature, therefore, will concentrate only on the empirical and theoretical data which specifically relates to students.

Hunt and his associates have theorized that the different conceptual systems constitute a four stage hierarchy. As Hunt (1971, p. 21) indicates:

> One must assimilate the norms of the generalized standard (Stage I work) before delineating oneself from it (Stage II work). Similarly, initial self-understanding (Stage II) is a prerequisite to an empathic understanding of others (Stage III). Thus, the four stage hierarchy rests on a logically related sequence. Successful articulation of the current stage is therefore one determinant of progression; another is the specific training condition.

This "training condition" is particularly relevant to the present study.

Training, as perceived by Hunt (p. 21), involves the matching of individuals and environments in a manner which best facilitates their growth toward the higher stage. To do this requires first, a specification of the current stage of the person who is the target object of the environmental intervention in order to determine what environment will provide the best match or mismatch. This match/mis-match potential is viewed in relation to its effect on the conceptual work at that stage.

Thus, Hunt hypothesized (pp. 43-44) that the optimal environment for the low conceptual level student would be one which is highly structured, while the optimal environment for high conceptual level students would be highly autonomous, with minimal structure. He also hypothesized that in some cases the high conceptual level student would not be affected by the structure.

Empirical support for these hypotheses was provided in a number of studies, the most recent of which were those by McLachlan (1969), Tomlinson (1969), and Tuckman (1968). In an experimental study, McLachlan (1969) investigated the interactive effects of learner conceptual level and variations in structure. These variations were represented by a discovery (low structure) versus lecture (high structure) approach, with equal numbers of low and high conceptual level students, matched on ability, assigned to each of the two conditions. Measuring recall related to a Picasso painting, he found low conceptual level students performed significantly better with the high structure than with low structure. He found no difference for the high conceptual level students.

In his study, Tomlinson (1969), investigated the differential effects of rule-example order as a function of learner conceptual level. Groups of students with high and low conceptual levels were assigned equally to three treatment conditions varying in degree of structure. Low structure consisted of instruction in which examples were presented first with the rule presented at a much later time. Intermediate structure consisted of instruction in which the examples were presented first, followed almost immediately by the rule. In the high structure condition, the rule was presented first. Tomlinson's results showed a high positive correlation between learning of concepts by low conceptual level students and the high structure situation, and no significant difference in learning in the high conceptual level group in the different conditions.

Tuckman (1968) investigated the interactive effects of learner conceptual level with degree of structure, represented by non-directive teachers (low structure) and directive teachers (high structure). He found that, compared to the other three combinations, the high conceptual level students with directive teachers rated these teachers lower and were less satisfied with them.

In a recent study of 900 kindergarten through sixth grade students and their teachers, Harvey and his associates (Harvey, 1970b) measured both student and teacher belief systems and also obtained student ratings of teachers. They found that children with different personalities reacted differently to teaehers with different belief systems. As one example cited by Harvey (p. 73), students with a high need for structure and guidance reacted negatively to System III and even System IV teachers, reporting that these teachers did not give them freedom. The reverse was true for students low in need for structure and high in independence. According to Harvey (p. 73), these findings suggest that from a subjective viewpoint, "freedom is the provision of an environment that meets the person's individual needs."

These separate findings are relevant to the present study for a number of reasons. First, they clearly indicate the need for teachers to be able to ereate different environments for different students or, at the least, the importance of matching students and teachers. This again suggests the need to study the relationship between teacher personality characteristics and the elassroom environment. Second, they lend further support to one of the

theoretical bases for the present study, Conceptual Systems theory. Finally, they suggest that the student's perception of the environment is likely to be determined, in part, by the similarity between the conceptual systems of the teacher and the students. Thus, the present study includes a measure of student conceptual systems and an examination of the relationship between teacher-student match and student perceptions of the classroom environment.

Formulation of Hypotheses

The previous section provided extensive empirical and theoretical support for each of the variables in the present study. Given these three variables, it is important that possible relationships be identified for closer investigation. To identify these relationships available literature concerning the major variables is examined as a means of delineating those relationships for which a theoretical base exists and/or which are most consistent with available empirical findings. Hypotheses are formulated through a search of the literature and a process of logical deduction.

Two major domains are investigated to suggest hypotheses:

1. The relationship between teacher conceptual systems and characteristics of the classroom educational environment as perceived by children.
2. The relationship between teacher-student similarity in conceptual systems and student perceptions of the classroom educational environment.

These investigations are described as follows:

Teacher Conceptual Systems and the Classroom Educational Environment

To generate hypotheses concerning the relationship between teacher conceptual systems and the classroom educational environment, a grid is presented to suggest tentative relationships between the sub-factors (see Figure 3). These relationships are then examined with reference to the previously cited literature in order to formulate hypotheses for further study.

Figure 3

Grid of Tentative Relationships Between Conceptual Systems and Environmental Factors

Conceptual Systems	Environmental Factors					
	Involvement	Humanism	Autonomy	Morale	Equity	Resources
System I	--		--	-		
System II			-	-		
System III	+	+	++	+		+
System IV	++	++	++	++	+	+

++ Indicates likelihood of a significant positive relationship
+ Indicates likelihood of some positive relationship
- Indicates likelihood of some negative relationship
-- Indicates likelihood of a significant negative relationship

System I - Given the basic definition of a System I individual, as described by Harvey (1971), and the particular teacher descriptions formulated by Murphy and Brown (1970, pp. 530-532) we can expect these teachers to be

essentially authoritarian and can expect their classrooms to be heavily teacher dominated. The previously cited studies by Harvey and his associates (1966, 1968), showed a high positive correlation between System I teachers and dictatorialness. Thus, it is likely that environments in these classes would be relatively low in Autonomy.

Harvey's studies (1966, 1968) have also shown a negative correlation between System I teachers and warmth toward students, and a negative correlation between System I teachers and student cooperativeness, involvement and helpfulness. Thus it is likely that System I teachers would have classrooms in which there was little Involvement in the environment.

Morale appears to be the one environmental factor which provides the best index of general student attitude towards the classroom. If we assume that most classes will contain a mixture of students of differing conceptual systems, the studies of Tuckman (1968) and Harvey (1970b) would suggest that Morale will be relatively low in the System I teacher's classroom because of the difference between the teacher's conceptual system and the systems of many of the students. There is, however, no significant empirical evidence to support this hypothesized relationship.

System II - The System II individual differs from the System I individual in terms of a slightly lesser degree of authoritarianism, greater rebelliousness, and increased unpredictability of behavior (Harvey, 1971; Murphy and Brown, (1970). Harvey (1966, 1968, 1970b) has found relatively

fe teachers in this system, however, and there are few empirical results reported showing relationships between this system and either teacher behavior or classroom environment. Thus, although it might be assumed that the classroom environments of System II teachers will have minimal Autonomy and low Morale, no hypotheses are advanced for further study at this time.

System III - In the early Harvey study (1966) System III teachers were found to have classroom atmospheres in which creativity and individual student responsibility were encouraged, although in both cases System IV teachers were rated slightly higher. Harvey (1970b, p. 14) has more recently reported findings that System III teachers, more than those in other systems, "tended to pursue a classroom policy of laissez faire. . ." The teaching pattern of System III teachers hypothesized by Murphy and Brown (1970, p. 531) is one in which pupils are encouraged to express themselves, in which searching by pupils is rewarded, and in which there is less sanctioning of obedience to rules. Both the empirical findings and the hypothesized relationships suggest a possible positive relationship between System III teachers and Autonomy in the classroom educational environment.

The System III individual (Harvey, 1970b; 1971) is characterized by an outward emphasis of friendship, interpersonal harmony, and mutual aid. Thus, as Murphy and Brown indicate (p. 531), the System III teacher is likely to exhibit greater warmth and is likely to sanction closer student-student relations. In both of their major studies, Harvey and his colleagues (1966, 1968) found

teachers in Systems III and IV rated higher by outside observers in warmth towards students. These teachers also had classroom atmospheres which were rated higher in involvement, cooperativeness, and helpfulness. At the same time, System IV teachers scored higher in all of these categories than System III teachers. Thus, it would appear that System III teachers should score higher in Involvement than System I teachers.

Finally, it might be expected that the Morale in System III teachers' classrooms would be relatively high since that factor measures a warm student-teacher relationship and a friendly and cheerful environment. In at least one study, however, Harvey (1970b, p. 14) found that System III teachers may not provide enough structure for many students and these students may react hostilely. Therefore, this relationship is not advanced as a hypothesis.

System IV - The System IV person (Harvey, 1971) is characterized as an independent individual who is able to change set, withstand stress, and behave creatively. This individual is also seen as being able to use rules pragmatically, not for their own sake. In addition, the System IV teacher (Murphy and Brown, 1970) is characterized as one who will encourage pupils to reflect on their own ideas and who rewards students' independent thinking.

Harvey's studies (1966, 1968) have shown these teachers to be most resourceful and least dictatorial and punitive in their behavior. These studies have also indicated that System IV teachers are likely to have classrooms in

which there is high involvement, cooperation, activity, achievement, encouragement of individual responsibility, encouragement of creativity, and use of resources. In the most recent study cited (Harvey, 1970b), students rated System IV teachers highest in fostering cooperativeness, exploration and espirit de corps.

Given these findings, it seems likely that these teachers will have classroom environments in which there is a relatively high frequency of positive responses for each of the environmental variables, with the Harvey studies providing empirical support for significant positive scores on Involvement, Humanism, Autonomy, and Morale. In addition, Joyce and Hunt have hypothesized that the high conceptual level teacher is more likely to be able to radiate a wide variety of environments (1967, p. 254). They are suggesting that these teachers will be able to select from a wide repertoire of behaviors those which are most appropriate for the student in a particular situation. If this is true, it is reasonable to expect that these teachers will, over a period of time, be able to meet the needs of the greatest number of students.

Thus, based on both the theory and the empirical findings the following hypotheses are advanced for further study:

H_1: There will be significantly higher scores for Involvement in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_2: There will be significantly higher scores for Autonomy in the classroom educational environ-

ment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_3: There will be a significantly higher number of total positive responses across environmental variables in the classrooms of System IV teachers than in the classrooms of System I, System II, and System III teachers.

Teacher-Student Conceptual System Similarity and Student Perceptions of the Classroom Educational Environment

Previously cited studies by Tuckman (1968) and Harvey (1970b) have provided evidenee that student perceptions of the classroom environment may be influenced by similarities and differenees between teacher and student conceptual systems. Tuckman's study showed high conceptual level students with directive teachers rated these teaehers lower. Harvey's study showed that students in Systems I and II reacted negatively toward teachers in Systems III and IV. It may therefore be expected that the general perceptions of the classroom environment of students whose conceptual systems are similar to the teaeher's will be more positive. Although it would be possible to generate other hypotheses based on the student-teaeher match, the relatively untested nature of the Student Self-Conception Test (see Chapter III) suggests that it should be used with caution. Thus, only the more general hypothesis is advanced as follows:

H_4: There will be a significantly higher number of total positive responses across environmental variables by those students whose conceptual systems are similar to their teacher's than by those students whose conceptual systems are dissimilar to their teacher's.

In summary, the following hypotheses are advanced for investigation in the present study:

H_1: There will be significantly higher scores for Involvement in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_2: There will be significantly higher scores for Autonomy in the classroom educational environment of System III and System IV teachers than in the classroom educational environment of System I teachers.

H_3: There will be a significantly higher number of total positive responses across environmental variables in the classroom of System IV teachers than in the classrooms of System I, System II, and System III teachers.

H_4: There will be a significantly higher number of total positive responses across environmental variables by those students whose conceptual systems are similar to their teacher's than by those students whose conceptual systems are dissimilar to their teachers.

This chapter has reviewed the literature and research which are pertinent to the current investigation and has described the formulation of hypotheses. In the next chapter the research procedures for the present study are presented.

CHAPTER III

RESEARCH PROCEDURES

The purpose of this chapter is to describe the research methodology of the present study. Procedures for obtaining the sample of fifty-two elementary school classrooms are outlined. In addition, a description is provided of the diverse demographic characteristics of the twelve selected elementary schools. Also, the process used for data collection is delineated. The last section of the chapter describes the instruments used.

Sample and Data Collection

The intention of the investigator was to select classrooms representing diverse population clusters, settings, and demographic conditions so that a characterization could be made of the larger elementary school population. Also, the sampling had to be manageable within the financial constraints of the study. To this end, all school districts within a thirty mile radius of the University of Massachusetts were identified and each of the districts was assigned a number. To obtain a minimum sample of ten districts and fifty classrooms, seventeen school districts were then selected using a random sampling procedure. Superintendents of these districts were contacted both by mail and phone for purposes of soliciting their participation and to identify a

single elementary school within each district which provided the diverse demographic characteristics being sought. Twelve of these districts responded affirmatively. The final sample consisted of fifty-two classrooms in twelve elementary schools. The diverse characteristics included a range of per-pupil expenditure from $572 to $937, a school enrollment range of 116 to 624, and schools from city, suburban, and rural communities.* These and other demographic characteristics are described in Table 1. The varied class sizes are presented in Table 2.

Principals of the participating schools were contacted by telephone and arrangements were made for administering the instruments to the selected fifth and sixth grade classes and teachers. Data collection was scheduled for a single hour during the regular school day. Pupils were scheduled to complete the ESES and the SSCT in their classrooms, and arrangements were made to administer the TIB test to the teachers in a separate room during the same hour.

A team of twelve graduate students was formed to assist in the data collection process. The intent was to be able to provide a single proctor for each classroom and one proctor to administer the TIB test to the teachers. Two seminars were held to make certain that the instruments would be administered

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*Both of the large urban districts selected were already overcommited to research efforts within their schools and were unwilling to participate. Thus, no inner-city population was included in the final sample.

Table 1

School Demographic Information

Code Number	Type of School	School Enrollment	Approximate Socio-Economic Class	Number of Pupils in School District	Per-Pupil Expenditure	Population of Municipality*	Classification of Municipality	Number of Classrooms Investigated
000	K-6	348	Middle	1,937	$740	13,550	Urban Town	3
001	K-6	360	Middle	680	740	2,800	Town	4
002	K-6	350	Lower Middle	2,200	650	2,064	Town	5
003	K-6	624	Middle	3,731	742	15,029	Urban Town	10
004	K-6	188	Lower Middle	1,987	724	8,600	City	2
011	K-6	335	Lower Middle	5,939	572	28,633	Urban Town	3
012	K-6	289	Middle	4,775	851	25,666	City	7
013	K-6	124	Middle	1,571	937	1,074	Town	2
014	K-6	513	Middle	3,813	756	17,928	Urban Town	7
022	K-6	138	Upper Middle	1,824	761	850	Town	2
024	K-6	510	Upper Middle	4,824	640	22,455	City	6
031	K-6	116	Upper Middle	514	816	1,005	Town	1

*According to the 1970 edition of the Commercial Atlas and Marketing Guide, Rand McNally & Company.

Table 2

Classrooms and Students in Survey Sample

Classroom Number	Student Sample
00000	21
00001	22
00002	19
00100	24
00101	24
00102	31
00103	28
00200	27
00201	6
00202	23
00203	19
00204	17
00300	27
00301	22
00302	22
00303	24
00304	25
00310	25
00312	25
00313	25
00314	26
00320	23
00400	25
00401	23
01100	25
01101	25
01102	28
01200	23
01201	25
01203	29
01204	22
01210	23
01211	9
01212	25
01300	17
01301	16
01400	18
01401	28
01402	26
01403	21
01404	27
01410	20
01411	20
02200	23
02201	18
02400	27
02401	23
02402	26
02403	24
02404	22
02410	22
03100	15

in a uniform way, to discuss the nature of the study, and to prepare members of the team for possible problems that might arise. The first seminar focused on the problem and purpose of the study and on the overall plan for data collection; the second seminar concentrated on the specific process of administering the instruments.

After this training, the following procedures were used to administer the student questionnaires:

1. The researcher introduced himself to the class, briefly explained the procedure for the hour, and related the general purpose of the questionnaires.
2. Each student was given a copy of the Elementary School Environment Survey and an optical scanning sheet. The researcher checked to make sure that each student had a pencil.
3. Students were asked to read the introductory section silently while the researcher reviewed these directions aloud.
4. The procedure for making the answer sheet was illustrated on the blackboard and students were assisted in filling in the school, class, and student numbers, and the other biographical information.
5. The researcher emphasized the fact that student names

were not being requested and that neither the teacher nor the school were being evaluated. Students were told that there was no time limit for completion of the questionnaire and were encouraged to ask for help with questions they did not understand.

6. As each student finished, the researcher collected the questionnaire and informally checked the answer sheet to make certain that all items were completed and that the school, class, and student numbers were clearly marked.
7. When all students had completed the ESES, students were given a minute or two to stand and stretch before beginning the second questionnaire.
8. Students were given copies of the Student Self-Conception Test and optical scanning sheets and the same basic procedure was followed as for the ESES.

The "This I Believe" Test was administered to the teachers, using the following guidelines for administration:

1. The researcher introduced himself and briefly described the general purpose of the test.
2. Teachers were given copies of the test with school numbers and teacher numbers already entered.

3. Teachers were asked to read the introductory section silently and to ask questions regarding anything they didn't understand.
4. The researcher stressed the fact that teachers would be timed on each item and would have to work rapidly. Also, it was indicated to the teachers that they had to write on each topic in the order of appearance and could not turn back to questions.
5. Teachers were given two minutes for each of the first five questions and slightly less time for the last five.

Usable data was collected from 1,180 fifth and sixth grade students and 52 teachers in twelve elementary schools.

Instrumentation

Three questionnaires were used in collecting data. A classroom edition of the Elementary School Environment Survey (ESES) was used to measure classroom educational environment. Environment scores were obtained along the dimensions of Involvement, Humanism, Autonomy, Morale, Equity, and Resources. The Student Self-Conception Test (SSCT) was used to measure student conceptual systems as reflected in the following behavioral dimensions: Need for Structure, Hostility, Sociability, and Independence. The "This I Believe" Test was employed to identify teacher conceptual systems ranging

from System I, most closed and concrete, to System IV, most open and abstract. Each of these instruments is described in detail in the remainder of this section.

The Elementary School Environment Survey (ESES). The ESES was originally developed by Sinclair in 1968 and was based upon the original design used by Pace (1963) in the CUES instrument for measuring college environments. The ESES assessed the elementary school environment along the five variables of Propriety, Community, Awareness, Practicality, and Scholarship. Using this instrument, Sinclair determined that similarities and differences existed in the educational environments of sixteen California elementary schools.

In an attempt to refine the instrument, Sadker (1971), working with Sinclair, administered the ESES to 54 schools in the state of Massachusetts. Sadker used factor analytic techniques to analyze the data and, as a result, suggested revisions of the original five environmental variables. The new factors were named Alienation, Humanism, Autonomy, Morale, Opportunism, and Resources. The revised instrument contained forty-two items, including eight that were newly created.

The present study utilizes the revised ESES, but makes a number of minor changes in wording to adapt it for measuring classroom environment. The words "the teacher" are repeatedly substituted for the word "teachers," and the word "classroom" or "class" for the word "school." Additionally, the two negatively described factors, Alienation and Opportunism, have been

changed to Involvement and Equity to provide a positive thrust for all factors. Also, minor changes were made in marking instructions and in the wording of a few questions to provide greater clarity. As finally administered, the instrument is a forty-two item survey of conditions, behaviors, and feelings about the classroom educational environment. Students were asked to respond by marking TRUE or FALSE for each statement. The revised ESES (Classroom edition) is included in Appendix B1.

An assessment of the reading level of the revised ESES was obtained by McKay (1971) and Bender (1971). Applying the Lorge formula (1959) for estimating difficulty of reading materials, McKay and Bender obtained a Readability Index of 4.47 which describes the estimated reading grade level of the instrument. This indicates that the material in the revised ESES is within the reading comprehension of average fourth grade children. Lorge (p. 1) cautions that this index should not be considered definitive, "nevertheless, the Lorge formula provides an overall estimate which should be useful in grading materials."

The method of scoring the ESES has varied. The method used in scoring the original instrument was the "66 plus 33 minus." This method consists of assigning a plus one to each item that 66 per cent of the students answered in the keyed direction and a minus one to each item which 33 per cent or less of the students answered in the keyed direction. The score of each variable is obtained by summing the item scores for the variable and adding a constant to eliminate negative numbers.

A second scoring procedure has used the per cent of students responding to an item in the keyed direction as the item score. The variable score is composed of the means of the item scores that make up a particular variable.

Both of these procedures derive the variable score by totalling and converting to per cents student responses across items. Neither uses individual student scores for each variable as a way to derive school scores. Because of the focus in the present study on both individual student responses and classroom scores, a third technique, used by Bender (1971) is employed.

Responses in the keyed direction are considered "correct" responses. The sum of the "correct" responses for a particular variable constitutes the student score for that variable. These individual student scores are used in the data analysis procedure for each of the hypotheses. Individual student scores are summed and a mean calculated to derive a classroom score for each variable and to provide an environmental profile for each classroom.

Pace and Stern (1958, p. 272) have indicated that it may not be appropriate to obtain conventional reliability estimates for instruments such as the ESES. As Pace has reported, in measuring students' perceptions of the environment a high degree of consensus among the respondents is desired, thus it is hoped that there will be a low variance in a distribution of scores within a given classroom or school. Typical correlational and variance methods of estimating reliability are therefore inappropriate since they measure reliability as a function of a wide distribution of scores.

To obtain a rough measure of reliability within these considerable limitations, data was collapsed across classes and a Kuder-Richardson reliability estimate, using Formula 20, was performed for each variable and for the test as a whole. The results are reported in Table 3.

Table 3

Kuder-Richardson (20) Reliability Estimates for the ESES

	ESES Variables and Total Score						
	Involvement	Humanism	Autonomy	Morale	Equity	Resources	Total
Reliability Estimates	.64	.39	.58	.73	.34	.54	.79

Given the stated limitations, the reliabilities are relatively high for Involvement, Autonomy, Morale, Resources, and for total responses. The reliability estimate for Humanism and Equity are low and suggest the need for further refinement of these variables.

The validity of the present form of the ESES is estimated on the basis of a review of earlier studies employing the instrument, an examination of the reactions and comments of pupils regarding specific items, a systematic examination of the instrument by the investigator, and a factor analysis of the items.

First, content validity is considered. Sinclair (1968, p. 48) reviewed Pace's (1963) analysis of the psychometric properties of the CUES instrument and Pace's conclusion that the substance or content of the measure is representative of the environment being considered. Sinclair showed that the derived items in the ESES were representative of the characteristics of the defined environmental variables.

Bender (1971) and McKay (1971) assumed that content validity for the original ESES could be transferred to the revised ESES but still made a systematic effort to analyze the instrument for content validity. After administering the instrument in each school, members of the data collection team reviewed evident problems and discovered that the following four items generated frequent and considerable misunderstanding:

- Many of the teachers go out of their way to help students.
- Students do not get any special favors in this school.
- Students that the principal and teachers know will have it easier in this school.
- Teachers seldom take their classes to the library so that students can look up information.

Since misunderstanding about the meaning of these items constituted a threat to content validity, Bender and McKay excluded the above items from their analysis.

Using a similar process, members of the data collection team for the present investigation were consulted and reported that there were repeated questions and problems regarding the following items:

14. Students do not get any special favors in this classroom.

15. Many students like to stay around after class is over.

21. Students know who the most important people are in this classroom.

27. The teacher seldom takes this class to the library so that students can look up information.

49. If students are unhappy in this class, the teacher will call their parents.

It should be noted that items 14 and 27 are virtually the same as two of the items which Bender and McKay excluded from their analyses. Given the threat to content validity posed by the difficulty students had in understanding the meaning of each of these items, they are all excluded from the analysis of data.

Further systematic examination of the instrument by Bender and McKay led them to conclude that the items reflected the appropriate environmental variables with the possible exception of the following item:

- Most of the teachers in this school are unfriendly.

Thus, to strengthen the construct of the Morale and Resources factors, this item was associated with Morale rather than with the Resources variable. Based on these conclusions, the similar item in the present investigation, number 17, is included in the Morale variable.

A similar investigation was undertaken in the present study to determine if the items in the instrument represented characteristics of the defined environmental variables. This investigation determined that since the school playground was frequently utilized by a mixture of students from different

classrooms the following item was not appropriate for measuring classroom educational environment:

> 31. Many students in this class do not behave while they are on the playground.

This item was therefore excluded from the final analysis.

Support for the construct validity of the ESES was provided by McKay (1971) through a replication of the factor analytic procedures used by Sadker (1971). It is likely that if Sadker's constructs are valid, they should be supported when the same factor analytic procedures are replicated with new data. McKay faced two problems in this attempt. First, Sadker used two separate populations for this study, students who completed form A and students who completed form B of the original ESES. Sadker performed separate factor analyses of each group and then combined the findings to form the new instrument. McKay used a single population. Second, in factor analytic studies it is mathematically desirable to have a sample twice as large as the number of variables. This was not possible in McKay's analysis and therefore deceptively high results may have occurred in the factor loadings.

Nevertheless, McKay's results (pp. 53-56) yielded strong support for the six factors derived by Sadker. Although the results were not substantial enough to provide conclusive support for the six environmental factors, McKay indicated that there was sufficient agreement between the two analyses to infer adequate construct validity. At the same time, because of the low communality level of the following item, it was excluded from the final analysis:

- Students here are very quick to tell teachers about things that should be changed.

Based on McKay's findings, the similar item in the classroom edition is excluded from the analyses of data in the present study.

Since the changes made in constructing the classroom edition of the ESES were minor, it can probably be assumed that construct validity can be transferred to this edition. Nevertheless, to gather data which is likely to be helpful in further refinement of the instrument and which will provide further evidence concerning construct validity, a factor analysis of the data was performed. Items already rejected because of inadequate content validity were excluded from this analysis; all other items were included. The results, presented in Table 4, show lower factor loadings for many items than those originally obtained by Sadker and raise serious questions about the construct validity of the Humanism factor. Of additional importance, Involvement and Autonomy, both of which are important in the hypotheses for the present study, have relatively high factor loadings.

Finally, based on both the present investigation and earlier studies, seven items, 9, 14, 15, 21, 31, and 49 were excluded from the analysis of data. An additional item, 17, is associated with the Morale variables rather than the Resources variable with which it was originally associated. The full grouping of ESES items by factors is included in Appendix A1.

Given these changes and the results of both the earlier and recent investigations, it can be assumed that the classroom edition of the ESES has

Table 4

Comparison of Factor Loadings for ESES*

Item	FACTOR					
	Involvement	Humanism	Autonomy	Morale	Equity	Resources
11	.66					
25	.85					
35	.70 (-.62)					
37	.76 (-.32)					
41	.72 (-.55)					
48	.70 (-.70)					
16		.66				
18		.77				
22		.46				
23		.42				
26		.76				
33		.90				
10			.82 (-.63)			
12			NF (-.66)			
19			.57 (-.50)			
32			NF (-.41)			
40			.50			
47			.35 (-.47)			
17				NF		
24				.55 (-.38)		
29				.58 (-.47)		
34				.78 (-.62)		
43				.78 (-.43)		
44				.48		
20					.68 (.37)	
30					NF	
36					NF	
39					-.37	
46					NF (.62)	
50					.81	
13						-.51
28						NF
38						-.40 (-.56)
42						-.35 (-.56)
45						NF (-.40)

*Where possible, two factors loadings are reported for each item. Factor loadings in parenthesis are those obtained by the present cross-validation. The other factor loadings are those reported by Sadker (1971). New items generated by Sadker were not factored (NF). Items receiving less than .30 loadings in the present analysis are not reported.

content and construct validity at a level of confidence that permits its use for research purposes, but not at a level of confidence that permits one to interpret findings without taking into consideration the fact that the validity could be strengthened and needs further examiniation. As Cronbach (1970, p. 121) has noted, ". . . construct validity is established through a long-continued interplay between observation, reason, and imagination." Further refinement of the ESES is needed, and continued collection of evidence is necessary if construct validity is to be established.

The "This I Believe" Test (TIB). The TIB was developed specifically as a measure of conceptual or belief systems by O. J. Harvey and his associates (1966, 1968, 1970a). The individual is asked to indicate beliefs about a number of socially and personally relevant concept referents by completing in two or three sentences the phrase, "This I believe about _____." The blank is successively replaced by references such as "religion," "friendship," and "the American way of life." The full test is included in Appendix B2.

Respondents are classified into one of the four conceptual systems hypothesized by Harvey, Hunt, and Schroder (1961) through an analysis of their individual responses. Criteria used in this analysis include (Harvey, 1972): degree of complexity, openness, candor, optimism, externality, evaluativeness, and cynicism.

More specifically, respondents are classified into the four systems based on the following criteria (Harvey, 1970a, pp. 72-73):

System I: If their completions denote such attributes as high absolutism, high tautologicalness, high frequency of platitudes and normative statements, high ethnocentrism, high religiosity, polarized judgements, and identification with the dominant American motif.

System 2: If in addition to being highly evaluative and absolute they express strong cynical attitudes toward sueh referents as "marriage," "religion," and others refleetive of the dominant American theme without giving mueh thought to the possible results of negating these referents or consideration of alternatives.

System 3: If they indicate more relativism and less evaluativeness than Systems 1 and 2 and at the same time express more positive beliefs about friendship, people and general humanism and imply that friendship and/or people are a necessary and critical aspect of their existence.

System 4: If their responses imply a high degree of novelty and appropriateness, independence without negativism, high relativism and contingency of thought, openness to new information, the general use of multiple dimensions instead of single dimensions in their judgements and statements that are highly integrated and informationally loaded.

Harvey (1970a) reports high reliability for the instrument. Specifically, interjudge reliability of the TIB scores, based on six specific comparisons, has been .91. Test-retest reliabilities, within one week and after six months, has been in the high .80's.

Construct validity of the instrument remains unsubstantiated. As indicated in Chapter I, it is still unelear whether the instrument measures the structural variable of integrative complexity or primarily measures personal and social eontent (Kogan, p. 278). In essence, there is no support for the

assumption that the instrument measures integrative complexity.

The instrument does, however, appear to have considerable concurrent validity. Harvey and his associates (1966) found that preschool teachers of conerete and abstract conceptual systems differed markedly in the classroom environments they created for students. Teachers representing System IV differed from representatives of System I on all 26 dimensions of classroom behavior on which they were rated, with statistically significant differences on 14 dimensions. These findings were replicated in a seeond study (Harvey, et al., 1968) in which it was found that teachers' conceptual systems affect their resourcefulness, dietatorialness, and punitiveness in the classroom. The most reeent study reported by Harvey (1970b) provided further evidence that there were significant correlations between teacher eonceptual systems as measured by the TIB and teacher classroom behavior. These studies are reviewed in detail in Chapter II.

Harvey and his associates have developed another test, the Conceptual Systems Test (CST) which is dcsigned to measure the same basic constructs. Harvey reports (1970a) that the TIB is superior in identifying System IV individuals. He attributes this to the fact that the TIB is sensitive to both the openness and eomplexity of responses, both of which are weighted heavily in classifying individuals as representing System IV while the CST measures neither of these faetors. Harvey's judgment in this respect contributed heavily to the decision to use the TIB and not the CST in the present study.

The Student Self-Conception Test (SSCT). The Student Self-Conception Test was originally designed by Harvey and Prather and was first reported by Harvey (1970b). The test asks students to report on their own thoughts, feelings, and actions in school and consists of eighteen items which are responded to as either True or False. Harvey and Prather administered the test to 900 students in kindergarten through sixth grade, with the items being read aloud to the younger children. The complete SSCT is presented in Appendix B3.

Cluster analysis proeedures (Tryon and Bailey, 1970) were used to isolate four variables which appeared to correspond to the behavioral correlates of the four conceptual systems. The four variables were tentatively labeled as Need for Structure, Hostility, Sociability, and Independence. The grouping of SSCT items by factors is included in Appendix A2. Harvey and Prather (Harvey, 1970b) also found that there were significant correlations between these variables and student perceptions of the classroom environment. These correlations, which were similar to those hypothesized by the investigators, provided some limited evidence concerning the concurrent validity of the instrument.

To obtain further evidence concerning construct validity of the SSCT, a factor analysis of the present data was performed. The results are reported in Table 5 and show low to moderate factor loadings for most items. These findings were similar to those originally reported by Harvey and Prather and indicate sufficient construct validity to justify further use of the SSCT in

Table 5

Factors and Loadings for SSCT

	Harvey-Prather Study	Present Study
Factor I: Sociability		
21. I like almost everybody in my class	.61	.39
24. Most children are fun to play with	.55	.43
13. I like to work with other children	.50	.52
10. I get along with the other children in my class	.43	.46
11. I like to have lots of friends	.41	.45
19. I get along well with my teachers most of the time	.34	.25
12. I feel bad when other children get mad at me	.27	.25
16. If I could I'd fight with lots of people	-.26	-.26
Factor II: Independence		
8. When the class is noisy it bothers me	-.51	-.47
18. It's O.K. if other children talk to me or hang around when I'm working	.45	.34
17. If I'm not sure what we are doing in our school work it makes me feel scared or worried	-.40	-.48
12. I feel bad when other children get mad at me	-.31	-.49
14. I like to be told exactly what work to do and how to do it.	-.25	-.25

Table 5 (continued)

	Harvey-Prather Study	Present Study
Factor III: Hostility		
22. I'd like to fight anybody who tries to push me around	.62	.49
16. If I could I'd fight with lots of people	.52	.55
9. Sometimes I get mad at my teacher	.35	.27
20. I like it when I can do things my own way	.33	.24
19. I get along well with my teachers most of the time	-.27	-.45
12. I feel bad when other children get mad at me		-.45
Factor IV: Need for Structure		
23. I like to work by myself	.42	.34
8. When the class is noisy it bothers me	.41	.56
9. Sometimes I get mad at my teacher	-.35	-.27
19. I get along well with my teachers most of the time	.26	.39
14. I like to be told exactly what work to do and how to do it.	.24	.19
18. It's O.K. if other children talk to me or hang around when I'm working		-.46

empirical research. At the same time, these findings, and the questionable use of some items in more than one factor, suggests a need for continued refinement of the instrument.

No data concerning the reliability of the instrument was available from earlier studies. To provide some information in this regard, a generalized split-half reliability test was performed. The results, described in Table 6, indicate moderate reliability for each of the variables. As noted by Hoffmeister (1972), the small number of items in each variable creates smaller coefficients and the reliability estimates are, therefore, likely to be somewhat misleading. The results also show significant negative correlations between Independence and Need for Structure, and between Hostility and Sociability, which are to be expected from the nature of the constructs.

Table 6

Correlation Matrix from Generalized Split-Half Reliability Test for SSCT

	Factor			
Factor	Need for Structure	Hostility	Sociability	Independence
Need for Structure	.428*			
Hostility	-.458	.525		
Sociability	.277	-.648	.579	
Independence	-.708	.428	-.381	.446

*Cronbach's Coefficient Alpha

In summary, each of the three instruments employed in the present investigation has adequate reliability and validity to permit their further use in empirical research studies. At the same time, content and construct validity has not been fully established for any of the instruments, and the reliability of both the ESES and SSCT could be improved. Thus, interpretation of the results of the present study must take into consideration the limitations of the instrumentation and should be viewed with humility.

The results of the ESES were summarized in terms of variable scores for each student, total "correct" responses for each student, a variable score for each classroom, and a mean total of "positive" responses for each classroom. The results of the TIB were summarized in terms of a variable score for each teacher, and the results of the SSCT were summarized in terms of a variable score for each student. The data from all of the instruments were prepared for analysis. Specific hypotheses for the study were then investigated by statistical examination of the differences between teachers with the varied conceptual systems for each of the environmental variables and across environmental variables, and between the environmental perceptions of students who were similar to their teacher in conceptual system and those students who were dissimilar. The next chapter describes these analyses.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter describes the analysis and interpretation of data obtained in the present study. After preparing the data for analysis, the relationship between teacher conceptual systems and the educational environment of the sampled classrooms is examined through analysis of variance procedures. This determines the acceptance or rejection of the first three hypotheses. The relationship between student and teacher conceptual system similarity and student perceptions of the classroom educational environment is then examined through similar procedures. This analysis determines the acceptance or rejection of the fourth hypothesis. Additionally, a ω^2 procedure is employed to provide estimates of the strength of the relationships between teacher conceptual systems and the environmental sub-factors, and between student and teacher conceptual system similarity and student perceptions of the classroom environment.

Preparation of the Data

Environment Variables. Student responses to the Elementary School Environment Survey (ESES) were transferred from optical scanning sheets to

computer cards. Using a computer program developed by Fred Dowaliby of the University of Massachusetts, items were grouped according to factors and both factor scores and total "correct" responses were obtained for each student. Next, mean scores were calculated for each classroom. Thus, each variable score for a single classroom represents the mean number of responses in the keyed direction for that variable. Each of the variables, with the exception of Resources, had a maximum total of six "correct" responses. There were five "correct" responses possible for Resources. The means for the six environment scores and the total "correct" responses for each class are depicted in Table 7. Means and standard deviations across classes are presented in Table 8. A frequency distribution of classroom scores for each variable was prepared after converting each of the factor scores into standard score equivalents. These distributions are displayed in Appendix C. The distributions for the variables of Involvement, Autonomy, Morale, and Resources appeared to approximate normal curves. The distributions for Humanism and Equity did not.

Teacher Conceptual Systems. Teacher answer booklets for the "This I Believe" Test were mailed to O. J. Harvey at the University of Colorado for scoring. Each test was scored by two individuals, Harvey and an associate, for conceptual systems and for each of the following dimensions: openness, candor, evaluativeness, externality, cynicism, optimism, and complexity. The two evaluators reached complete agreement on the systems scores for

Table 7

Mean Educational Environment Scores Per Classroom

Classroom Number	Involvement	Humanism	Autonomy	Morale	Equity	Resources	Total Positive
00000	4.29	2.95	4.57	3.67	2.86	2.10	20.43
00001	4.27	3.32	4.23	3.73	3.05	2.82	21.41
00002	4.32	3.63	3.63	2.95	3.42	2.16	20.11
00100	3.50	2.79	3.58	3.25	3.42	3.09	19.54
00101	2.92	2.63	2.50	2.17	3.04	2.33	15.58
00102	3.35	2.84	3.03	2.84	3.13	2.32	17.52
00103	4.25	3.21	3.07	3.43	3.21	2.21	19.39
00200	4.19	3.59	3.67	3.19	3.11	2.74	20.48
00201	3.50	2.83	2.00	2.33	2.67	3.17	16.50
00202	3.22	3.26	3.78	2.61	3.61	2.57	19.04
00203	4.16	3.79	4.16	3.26	3.37	3.21	21.95
00204	4.59	4.00	2.88	4.24	3.47	2.65	21.82
00300	2.67	2.52	3.44	2.11	3.22	1.37	15.33
00301	4.59	3.05	3.32	3.32	3.73	2.55	20.55
00302	4.14	3.41	2.82	3.77	3.82	2.91	20.86
00303	4.79	3.71	2.25	4.38	3.42	2.46	21.00
00304	4.80	3.40	2.44	4.08	3.85	2.35	20.92
00310	3.36	2.20	3.40	2.12	2.84	1.76	15.68
00312	4.32	3.96	3.08	4.00	3.56	1.72	20.64
00313	3.08	3.24	3.12	2.12	3.04	1.36	15.96
00314	4.35	3.42	2.85	4.15	3.73	1.77	20.27
00320	3.96	3.43	4.00	4.13	3.78	1.78	21.09
00400	3.24	2.60	3.68	2.68	3.00	2.76	17.96
00401	2.70	2.22	3.57	1.87	3.74	1.87	15.96

Classroom Number	Involvement	Humanism	Autonomy	Morale	Equity	Resources	Total Positive
01100	4.60	4.04	3.92	3.76	3.84	3.28	23.44
01101	4.52	4.16	3.16	4.44	3.80	2.92	23.00
01102	4.64	3.64	2.32	3.43	3.57	2.64	20.25
01200	4.17	2.78	1.91	3.61	3.82	2.57	18.87
01201	5.00	3.64	2.64	4.52	3.52	1.84	20.96
01203	4.86	2.66	3.17	3.90	3.90	1.62	20.10
01204	4.32	3.55	2.50	3.23	3.95	2.18	19.73
01210	2.74	1.96	3.13	2.48	3.30	1.87	15.48
01211	4.00	2.33	3.78	3.78	3.67	2.11	19.57
01212	3.88	2.00	2.40	2.84	3.68	1.20	16.00
01300	3.53	3.41	3.35	2.53	2.94	2.71	18.47
01301	4.63	2.75	4.19	3.44	3.63	3.63	22.25
01400	4.94	3.28	3.33	3.72	3.89	2.17	21.33
01401	3.57	2.79	2.93	1.96	3.86	2.18	17.29
01402	4.15	3.15	4.46	3.31	3.35	2.27	20.69
01403	4.14	3.43	3.19	2.43	3.81	2.43	19.43
01404	3.96	3.04	3.67	2.37	3.33	2.22	18.59
01410	5.05	3.38	3.62	4.71	3.38	2.42	22.67
01411	4.50	2.80	3.55	2.75	3.70	2.70	20.00
02200	4.48	4.09	3.83	4.00	3.35	3.48	23.22
02201	5.06	4.06	3.89	4.50	3.72	4.00	25.22
02400	3.33	3.67	3.30	2.52	3.59	2.37	18.78
02401	4.22	3.57	2.74	4.17	3.61	1.91	20.22
02402	5.15	3.96	2.46	4.23	3.35	2.19	21.35
02403	3.92	2.96	2.92	2.08	3.67	1.29	16.83
02404	3.50	2.59	2.68	2.91	3.32	2.05	17.05
02410	4.36	3.27	2.64	3.59	3.77	1.91	19.55
03100	3.80	2.93	4.40	3.07	3.33	2.67	20.20

Table 8

Educational Environment Data Across Classrooms

	FACTOR						
	Involvement	Humanism	Autonomy	Morale	Equity	Resources	Total Positve
Mean Scores	4.07	3.19	3.25	3.28	3.47	2.36	19.63
Standard Deviations	.41	.31	.41	.61	.10	.35	5.19

each of the teachers. The distribution of conceptual systems scores for the fifty-two teachers is displayed in Table 9.

Table 9

Conceptual Systems Scores for Teachers on the "This I Believe" Test

Conceptual Systems	Number of Teachers	Percentage of Teachers
System I	30	57.7%
System II	3	5.8%
System III	8	15.4%
System IV	11	21.1%

Student Conceptual Systems. The Student Self-Concception Tests were mailed to the Test Analysis and Development Corporation in Boulder, Colorado for scoring by Dr. James Hoffmeister and his associates. Individual item responses were scored and cluster analyses performed using the Tryon and Bailey system of cluster analysis (Tryon and Bailey, 1970). Overall scores on each dimension ranged from 1.00 to 2.00 and the cutoff points for dividing the scores into low versus high on any given dimension were: 1.69 (Need for Structure), 1.69 (Hostility), 1.89 (Sociability), and 1.59 (Independence). Of the 1,180 students sampled, 277 scored below the cutoff point for all of the dimensions. Each of the remaining 903 students scored above the cutoff point

in either one or two dimensions. Based on these seores, eaeh of the 903 students was eategorized as having one coneeptual system or a mixture of two conceptual systems. These eategorizations are displayed in Table 10.

The data eolleeted and prepared for eaeh of the major variables were then analyzed for the purpose of aeeepting or rejeeting the four major hypotheses.

Teacher Coneeptual Systems and Classroom Edueational Environment

The first three hypotheses, developed in Chapter II, are restated below:

H_1: There will be signifieantly higher seores for Involvement in the elassroom edueational environment of System III and System IV teaehers than in the classroom edueational environment of System I teaehers.

H_2: There will be signifieantly higher scores for Autonomy in the classroom edueational environment of System III and Sytem IV teachers than in the elassroom educational environment of System I teaehers.

H_3: There will be a signifieantly higher number of total positive responses aeross environmental variables in the elassrooms of System IV teachers than in the elassrooms of System I, System II, and System III teaehers.

These hypotheses were tested by first dividing the students into four groups based on their teaeher's eoneeptual systems. Thus, if a teacher was designated as System I, all students in the eorresponding elass were placed in the System I group. Student responses on the ESES were then used to obtain mean seores

Table 10

Conceptual Systems Scores for Students on the Student Self-Conception Test

Conceptual Systems	Behavioral Correlates Measured by SSCT	Number of Students	Percentage of Students
System I	Need for Structure	151	12.8%
System I and System II	Need for Structure and Hostility	3	.3%
System I and System III	Need for Structure and Sociability	131	11.1%
System I and System IV	Need for Structure and Independence	10	.9%
System II	Hostility	52	4.4%
System II and System III	Hostility and Sociability	0	0%
System III and System IV	Hostility and Independence	106	9.0%
System III	Sociability	227	19.2%
System III and System IV	Sociability and Independence	50	4.2%
System IV	Independence	173	14.7%
Below Cutoff for all Dimensions		277	23.4%

Table 11

Means and Standard Deviations for Environment Variables in Classrooms of Teachers with Each of the Conceptual Systems

Environmental Factors	System I (n=664)		System II (n=79)		System III (n=176)		System IV (n=262)	
	M	SD	M	SD	M	SD	M	SD
1. Involvement	4.05	1.57	4.12	1.17	4.04	1.50	4.08	1.39
2. Humanism	3.15	1.45	3.27	1.16	3.15	1.38	3.33	1.30
3. Autonomy	3.09	1.33	3.23	1.44	3.59	1.31	3.36	1.35
4. Morale	3.31	1.52	2.94	1.23	3.14	1.37	3.36	1.51
5. Equity	3.50	1.10	3.32	.98	3.36	1.05	3.53	1.17
6. Resources	2.29	1.18	2.11	1.20	2.40	1.30	2.41	1.14
7. Total Positive Responses	19.40	4.45	18.99	3.52	19.68	4.54	20.07	4.05

and standard deviations for each of the six environment variables and for the total positive or "correct" responses within each of the four groups. These results are presented in Table 11. An F-test was performed on each of the environment variables and on the total positive responses on the ESES to determine whether significant differences existed between the four groups. Where the F ratios were significant, the Neuman-Keuls procedure was used to compare pairs of groups in order to determine the specific significant differences.

The results of the analysis of variance, reported in Table 12, did not support the first hypothesis. These results show no significant differences for Involvement in the classroom educational environment between teachers with conceptual systems I, II, III, or IV.

Table 12

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Involvement

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	.5620	3	.1873	.0832*
Within Groups	2651.2890	1177	2.2526	
Total	2651.8510	1180		

*Not significant

The second hypothesis was supported by both the analysis of variance and the Neuman-Keuls procedures. The F test results are summarized in Table 13 and show a significant difference for Autonomy in the classroom environments of teachers with varied conceptual systems.

Table 13

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Autonomy

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	40.4545	3	13.4848	7.5308***
Within Groups	2107.5759	1177	1.7906	
Total	2148.0305	1180		

***p < .001

Post hoc contrasts were then performed on all pairs of means for the variable of Autonomy using the Neuman-Keuls procedure. As indicated by Hays (1963, p. 483) this type of post hoc comparison "is applicable only to the situation where a preliminary analysis of variance and F test has shown over-all significance. It is not a device for rescuing poor experiments by data juggling." An implicit assumption in the Neuman-Keuls procedure is equal sample sizes. Because the treated groups (Systems I, II, III, and IV) in the present study are unequal in size it was felt that an acceptable approach was to use the mean

for the total sample (N=295).* The basic results for this procedure as applied to the variable of Autonomy are summarized in Table 14.

The results of this analysis show that the classroom of System III teachers ($p < .01$) and System IV teachers ($p < .05$) scored significantly higher in Autonomy than the classrooms of System I teachers. Thus, the second hypothesis was supported. Additionally, significant differences were found between the classrooms of System III and System II teachers ($p < .01$) and between System III and System IV teachers ($p < .05$), with System III teachers scoring significantly higher in Autonomy in both cases.

An additional test was employed to provide an estimate of the strength of the relationship between System I teachers and Autonomy in the classroom educational environment and between System III teachers and Autonomy in the classroom educational environment. As Hays (1963, p. 322) indicates, "a significant result leads to the inference that some association exists, but in no sense does this mean that an important degree of association necessarily exists." To arrive at a more accurate measure of the relationship between the two variables, Hays (p. 325) suggests that the researcher determine the proportion of variance in one accounted for by the other or the omega value

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*The power of the Neuman-Keuls test and its adaptation to unequal sizes is described in B. J. Winer, Statistical Principles in Experimental Design. New York: McGraw Hill, 1962. For additional information on this test see Jerome C. Meyers, Fundamentals of Experimental Design, 2nd edition. Boston: Allyn and Bacon, 1972.

Table 14

Neuman-Keuls Test of Differences in Classroom Autonomy for Teachers with Each of the Four Conceptual Systems

Systems	Means	Differences Between Means
System I	3.0904	
System II	3.2278	.1374
System I	3.0904	
System III	3.5909	.5005**
System I	3.0904	
System IV	3.3626	..2722*
System II	3.2278	
System III	3.5909	.3631**
System II	3.2278	
System IV	3.3626	.1348
System III	3.5909	
System IV	3.3626	.2583*

*p < .05
**p < .01

squared (ω^2). While a significant result on an F or t test indicates that it is relatively safe to conclude that some relationship exists, it is not indicative of the degree of association between the variables (counter-intuitively, this is so even with F ratios far-exceeding required significance levels). The estimate of ω^2 indicates the degree of association. As Hays states (p. 328), "it seems far more reasonable to follow up a finding that is both significant and indicates a strong degree of association than to tie this course of action to significance level alone."

Thus, to obtain an estimate of the degree of association between System I teachers and Autonomy, and between System III teachers and Autonomy, the value of ω^2 was calculated for these pairs of groups where significant differences existed. The value of t was determined first and was then employed in the following formula (Hays, p. 326):

$$\text{est. } \omega^2 = \frac{t^2 - 1}{t^2 + N_1 + N_2 - 1}$$

The results, presented in Table 15, indicate that teacher conceptual Systems I and III each account for approximately 1 to 2 per cent of the variance in Autonomy in the classroom educational environment. Although the degree of association is relatively low in each case, the results provide some additional evidence that there are relationships between both System I and System III teachers and Autonomy in the classroom educational environment. Thus, future experimental research concerning the nature of these relationships appears to be warranted.

Table 15

ω^2 Test of Degree of Association Between Classroom Autonomy and Teacher Conceptual Systems

Systems	t	est. ω^2
Systems I and III	4.62	.024
Systems I and IV	2.94	.008
Systems II and III	1.94	.011
Systems III and IV	2.30	.010

The results of the analysis of variance for the total positive responses in the classrooms of teachers with the four conceptual systems have direct bearing on the third hypothesis and are detailed in Table 16.

Table 16

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Total Positive Responses on the ESES

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	112.2577	3	37.4192	2.0030*
Within Groups	21988.6635	1177	18.6820	
Total	22100.9213	1180		

*Not significant

The mean number of total positive responses in the classrooms of System IV teachers was higher than the mean for classrooms of each of the other groups of teachers, however the magnitude of the differences was not significant. Thus, although a trend consistent with the third hypothesis is suggested, the difference failed to reach significance.

The differences between the classrooms of System I, System II, System III, and System IV teachers for each of the other environment variables was examined through the use of F tests. The results of these analyses of variance are summarized in Tables 17, 18, 19, and 20.

An examination of Table 18 reveals that there were significant differences for Morale in the classroom educational environments of teachers between the four conceptual systems. No significant differences were found between the four groups for any of the other three environment variables.

The finding of significant differences for Morale suggested the value of further investigation of the relationship between teacher conceptual systems and Morale in the classroom educational environment. To this end, post hoc comparisons were performed on all pairs of means using the Neuman-Keuls test. The results of this analysis are provided in Table 21. Additionally, to determine the degree of association between variables, the value of ω^2

Table 17

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Humanism

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	7.2998	3	2.4333	1.2569*
Within Groups	2278.5173	1177	1.9359	
Total	2285.8171	1180		

*Not significant

Table 18

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Morale

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	15.4808	3	5.1603	2.6719**
Within Groups	2273.1796	1177	1.9313	
Total	2588.6605	1180		

**$p < .05$

Table 19

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Equity

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	5.9228	3	1.9743	1.6241*
Within Groups	1430.7767	1177	1.2156	
Total	1436.6994	1180		

*Not significant

Table 20

Analysis of Variance Between the Four Teacher Conceptual Systems in Terms of Classroom Resources

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	7.1478	3	2.3826	1.6717*
Within groups	1677.5059	1177	1.4252	
Total	1684.6537	1180		

*Not significant

Table 21

Neuman-Keuls Test of Differences in Classroom Morale for Teachers with Each of the Four Conceptual Systems

Systems	Means	Differences Between Means
System I	3.3148	
System II	2.9367	.3781**
System I	3.3148	
System III	3.1364	.1784
System I	3.3148	
System IV	3.3626	.0478
System II	2.9367	
System III	3.1364	.1997
System II	2.9367	
System IV	3.2626	.4289**
System III	3.1364	
System IV	3.3626	.2362

**$p < .01$

was calculated for those pairs of groups where significant differences had been discovered. These results are presented in Table 22.

Table 22

ω^2 Test of Degree of Association Between Classroom Morale and Teacher Conceptual Systems

Systems	t	est. ω^2
Systems I and II	2.60	.008
Systems II and IV	2.64	.017

The results of the Neuman-Keuls test indicate that the classrooms of System II teachers scored significantly lower in Morale ($p < .01$) than the classrooms of System I and System IV teachers. System II teachers also scored lower than System III teachers, although the magnitude of the difference was not significant. The estimated ω^2 values indicate that only a small degree of association, 1 to 2 per cent, exists between System II teachers and Morale. Nevertheless, taken together, these findings suggest that there may be a negative relationship between System II teachers and Morale in the classroom educational environment. Thus, it appears likely that the reported findings warrant specific attention in future research.

Teacher and Student Conceptual System Similaritity and Student Perceptions of the Classroom Educational Environment

The fourth hypothesis, developed in Chapter II, is restated as follows:

> H_4: There will be a significantly higher number of total positive responses across environmental variables by those students whose conceptual systems are similar to their teacher's than by those students whose conceptual systems are dissimilar to their teacher's.

This hypothesis was tested by first examining the scores for each student on the Student Self-Conception Test and determining whether that student was similar or dissimilar to the teacher in conceptual system. The behavioral correlates of conceptual system obtained from the SSCT were compared with the results for the teacher on the TIB to make that determination. Thus, for example, if the teacher in the class was classified as System I, a student scoring highest in Need for Structure (System I) was considered similar and a student scoring highest in Independence (System IV) was considered dissimilar. Only those students who were clearly similar or dissimilar to the teacher were included in the testing of the hypothesis. Individual students who scored high on two disparate categories such as Need for Structure (System I) and Independence (System IV) were not included, nor were students who scored below the cut-off points in all categories. Using this system, two relatively extreme groups of 200 and 178 students were created and were used to test the hypothesis.

Table 23

Means and Standard Deviations for Environment Variables in the Groups of Students Similar and Dissimilar to the Teacher in Conceptual System

Environment Variables	Similar (n=200)		Dissimilar (n=178)	
	Mean	SD	Mean	SD
1. Involvement	4.5850	1.2125	3.5730	1.4873
2. Humanism	3.5650	1.2822	2.7416	1.2758
3. Autonomy	3.3450	1.3584	3.1517	1.3632
4. Morale	3.6800	1.2985	2.9888	1.4575
5. Equity	3.6750	.9655	3.2809	1.0360
6. Resources	2.6250	1.2048	2.2135	1.2071
7. Total Positive Responses	21.4750	3.3714	17.9494	4.0159

The responses on the Elementary School Environment Survey for each of these two groups were then analyzed. Means and standard deviations for each variable and for total positive responses were calculated and are presented in Table 23. An F Test was then used to determine if the responses of the two groups were significantly different.

The results of the analysis of variance, indicated in Table 24, provided sufficient evidence to accept the fourth hypothesis. These results showed that those students whose conceptual systems were similar to the teacher's recorded a significantly greater number of total positive responses across environment variables than those students whose conceptual systems were dissimilar to the teacher's.

Table 24

Analysis of Variance for Total Positive Responses Between Students Similar and Dissimilar to the Teacher in Conceptual System

Sources of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	1170.6171	1	1170.6171	86.0273***
Within Groups	5116.4199	376	13.6075	
Total	6287.0370	377		

***$p < .001$

Also, to provide an estimate of the degree of association between teacher and student conceptual system match or mismatch and student perceptions of the classroom educational environment, the value of ω^2 was calculated for the two groups for the total positive responses on the ESES. The result of this procedure, included in Table 31 (p. 114), indicates that the match or mismatch between student and teacher conceptual systems accounts for approximately 19 per cent of the variance in student perceptions of the classroom educational environment. Given both the significance level of the F test and this relatively high degree of association, a follow-up experimental study appears likely to be profitable.

Although no hypotheses were advanced concerning the relationship between student and teacher conceptual system similarity or dissimilarity and student perceptions of the six environment variables, analyses of variance were performed and indicated significant differences. These results are summarized in Tables 25 through 30.

An examination of the results of the analyses of variance reveals significant differences at the .001 level between the similar and dissimilar groups for the variables of Involvement, Humanism, Morale, and Equity, and significant differences at the .01 level for the variable of Resources. There were no significant differences between the two groups for Autonomy. The ω^2 values were then calculated in order to provide an estimate of the degree of association between student and teacher conceptual system similarity or

Table 25

Analysis of Variance for Involvement Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F. Ratio
Between Groups	96.4473	1	96.4473	53.0097***
Within Groups	684.1056	376	1.8194	
Total	780.5529	377		

***p < .001

Table 26

Analysis of Variance for Humanism Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	63.8570	1	63.8570	39.0240***
Within Groups	615.2674	376	1.6363	
Total	679.1243	377		

***p < .001

Table 27

Analysis of Variance for Autonomy Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	3.5196	1	3.5196	1.9011*
Within Groups	696.0995	376	1,8513	
Total	699.6190	377		

*Not significant

Table 28

Analysis of Variance for Morale Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	44.9998	1	44.9998	23.7804***
Within Groups	711.4975	376	1.8923	
Total	756.4974	377		

***$p < .001$

Table 29

Analysis of Variance for Equity Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	14.6276	1	14.6276	14.6342***
Within Groups	375.8301	376	.9995	
Total	390.4577	377		

***p < .001

Table 30

Analysis of Variance for Resources Between Students Similar and Dissimilar to the Teacher in Conceptual System

Source of Variance	Sum of Squares	df	Mean Square	F Ratio
Between Groups	15.9490	1	15.9490	10.9679**
Within Groups	546.7626	376	1.4542	
Total	562.7116	377		

**p < .01

dissimilarity and student perceptions of Involvement, Humanism, Morale, Equity, and Resources. The results of this analysis are presented in Table 31.

Table 31

ω^2 Test of Degree of Association Between Student and Teacher Conceptual System Similarity or Dissimilarity and Student Perceptions of the Classroom Environment

Environmental Factors	t	ω^2
Involvement	7.06	.116
Humanism	6.22	.092
Morale	5.14	.064
Equity	3.76	.034
Resources	3.10	.021
Total Positive Responses	9.54	.193

These results indicate that the match or mismatch between student and teacher conceptual systems accounts for approximately 12 per cent of the variance in student perceptions of Involvement in the classroom educational environment, approximately 9 per cent of the variance in perceptions of Humanism, 6 per cent of the variance in perceptions of Morale, and less than 4 per cent of the variance in perceptions of both Equity and Resources. Considering both the significance level of the F test and the relatively high

degree of association, further experimental studies to help determine definite cause and effect relationships between student and teacher conceptual system match and the variable of Involvement appear to be warranted. Follow-up studies concerning the variables of Humanism, Morale, Equity, and Resources may also be of value, although the degree of association in each of these cases is less.

The overall results of both the testing of the fourth hypothesis and the examination of the differences between the similar and dissimilar groups for each of the six variables and for the total positive responses on the ESES suggests a significant relationship between student and teacher conceptual system similarity or dissimilarity and student perceptions of the classroom educational environment. This relationship appears to be strongest for total positive response and for the variable of Involvement. Given the limits imposed by using only relatively extreme groups, as well as the other delimitations of this study, it would be premature to recommend immediate changes in schooling based on these findings without considering the need for continued inquiry into the complexities and problems of student and teacher match. Nevertheless, these findings do make it clear that the relationship between student and teacher match or mismatch in conceptual systems and the classroom environment deserves the careful scrutiny and continued consideration of teachers, administrators, and researchers.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

This chapter provides a summary of the findings of the present study, draws conclusions related to these findings, and suggests potentially important implications for teacher and administrator training, school improvement, and further research.

Summary

The central purpose of this study was to determine significant relationships between teacher conceptual systems, student conceptual systems, and student perceptions of the classroom educational environment in selected elementary schools. A total of 1,180 students and 52 teachers in twelve selected schools comprised the sample. Student perceptions of the classroom educational environment were measured by the Elementary School Environment Survey (ESES), which assesses the classroom environment along six factors: Involvement, Humanism, Autonomy, Morale, Equity and Resources. Teacher conceptual systems were determined by responses on the "This I Believe" Test, a sentence completion instrument, and teachers were identified with one of the four conceptual systems. Student conceptual systems were measured by student responses on the Student Self-Conception Test, with most students

elassified into one of four categories. These categories, which are believed to be the behavioral correlates of the four conceptual systems, are: Need for Structure (System I), Hostility (System II), Sociability (System III), and Independence (System IV).

Analysis of variance procedures were used to determine if significant differences existed between the classrooms of teachers with differing conceeptual systems along each of the environmental variables, and for total positive responses on the ESES. Analysis of variance procedures were also used to determine if students with conceptual systems similar to the teacher's differed from students with conceptual systems dissimilar to the teacher's in their perceptions of the classroom educational environment.

Four hypotheses were stated in Chapter II. Two of these hypotheses were aeeepted and two were rejected. The findings of the analysis of variance showed that scores for Involvement did not differ significantly between the elassrooms of System I teachers and the classrooms of System III and System IV teaehers. Based on this finding, the first hypotheses (H_1) was rejected. The analysis did show that there were significantly higher scores for Autonomy in the classroom educational environment of System III ($p < .01$) and System IV ($p < .05$) teachers than in the classroom educational environment of System I teaehers. Based on this finding, the second hypothesis (H_2) was accepted and a signifieant negative relationship between System I teaehers and Autonomy was suggested. The absence of significant differences between the scores of teachers

with the differing conceptual systems for total positive responses led to the rejection of the third hypothesis, although a trend consistent with the hypothesis was evidenced.

Two additional significant findings resulted from the analysis of variance procedures. The scores for Autonomy across the classrooms of System III teachers were not only significantly higher than those of System I teachers ($p < .01$), but also significantly higher than those of System II ($p < .01$) and System IV (p .05) teachers. This finding suggests a significant positive relationship between System III teachers and Autonomy in the classroom educational environment. Also, it was found that scores for Morale across the classrooms of System II teachers were significantly lower than those of System I ($p < .01$) and System IV ($p < .01$) teachers. Finally, no significant differences were found between the four groups of classrooms for the variables of Humanism, Equity, or Resources.

The analysis of variance for the environmental perceptions of the students similar to the teacher in conceptual system and those dissimilar indicated that significant differences ($p < .001$) existed between the two groups for total positive responses on the ESES. Based on this finding, the fourth hypothesis (H_4) was accepted. Equally important, an analysis of the data employing a ω^2 formula revealed that the match or mismatch between student and teacher conceptual systems accounted for approximately 19 per cent of the variance in student perceptions of the classroom educational environment.

The analysis of variance for the matched and mismatched groups also revealed significant differences for the variables of Involvemcnt ($p < .001$), Humanism ($p < .001$), Morale ($p < .001$), Equity ($p < .001$), and Resources ($p < .01$). No significant differences were found for the variable of Autonomy.

Taken together these findings suggest a significant positive relationship between student and teacher conceptual system similarity and positive student perceptions of the classroom educational environment.

Conclusions

The purpose of the present study and the four hypotheses were conceived in response to three major questions. These questions, originally stated in Chapter I, are:

1. What is the relationship between teacher conceptual systems and student perceptions of the classroom educational environment?
2. What is the relationship between teacher conceptual systems and teacher ability to radiate a wide varicty of educational environments?
3. What is the relationship between teacher-student conceptual system similarity or dissimilarity and student perceptions of the classroom educational environment?

The conclusions of this investigation, which go beyond merely the acceptance or rejection of the hypotheses, are stated in relation to these original questions.

1. Teacher Conceptual Systems and Classroom Educational Environment. The inquiry into the relationship between teacher conceptual systems and classroom educational environment provided evidence of a significant positive relationship between System III teachers and Autonomy in the classroom educational environment and of a significant negative relationship between System I teachers and Autonomy.

These findings are similar to those obtained by Harvey and his associates (1966, 1968) using outside observers to measure the behavior of teachers and students, and by Harvey and Prather (Harvey, 1970) using students ratings of teachers. The finding that the classrooms of System III teachers had significantly greater Autonomy than the classrooms of System IV teachers supported the earlier Murphy and Brown (1970) theoretical description of System III and System IV teachers. It differed, however, from the early Harvey study (1966) in which outside observers did not find significant differences between System III and System IV teachers for the dimensions: enlistment of child participation, encourage individual responsibility, and need for structure. One possible conclusion is that while children in the classrooms of System III teachers do perceive greater Autonomy, outside observers do not.

More important, perhaps, these findings suggest that teachers whose conceptual systems are characterized by relative closedness, concreteness,

and simplicity of thought are more likely to contribute to the structuring of relatively teacher-centered and non-autonomous classroom environments. Similarly, the findings suggest that teachers whose conceptual systems are characterized by both relative openness and abstractness of thought and an emphasis on mutual dependency with others are more likely to foster classroom environments which encourage student independence and initiative, have more open communication, and place less emphasis on supervision and obedience to rules of protocol. Although further experimental research is needed to ascertain a definite cause and effect relationship, the present study does provide further evidence that such a relationship might exist.

A significant difference was also discovered between the scores for Morale across the classrooms of System II teachers and both System I and System IV teachers, with System II teachers scoring significantly lower. Although this finding is delimited by the small number of students (n=79) in the classes of System II teachers, it suggests that teachers whose conceptual systems are characterized by a high degree of distrust of and rebellion against societal norms may radiate classroom behavior which fosters an environment characterized by a negative student attitude towards the class, poor relations between learners and teachers, and disruptive student behavior. If, as theorized by Murphy and Brown, System II teachers do display greater rebelliousness in the classroom, the present findings may indicate that such behavior on the part of the teacher encourages similar behavior among the students.

The failure to find any significant differences for Involvement across the classrooms of the four different groups of teachers was contrary to one of the major hypotheses. One possible explanation lies in the formulation of the hypothesis. This formulation was based, in part, on the earlier Harvey studies which showed the classes of System I teachers as scoring lower in student cooperativeness, involvement, and helpfulness. The ESES, on the other hand, measures student perceptions and there may well be a difference between Involvement as measured by Alpha press and by Beta press. The ESES variable of Involvement may measure the student's feeling of involvement and belonging in the classroom, rather than physical involvement, the apparent focus in the Harvey study. Thus, one possible conclusion is that students' feelings of involvement and belongingness in the classroom are not related to the teacher's conceptual system.

2. Teacher Conceptual Systems and Teacher Ability to Radiate A Variety of Educational Environments. The findings regarding teacher conceptual systems and total positive responses by students on the ESES failed to show significant differences but did suggest a trend. As indicated in Chapter II, a hypothesis that System IV teacher would have more positive responses by students on the ESES than teachers with other systems was based on both the empirical findings of Harvey and his associates showing System IV teachers scoring higher in a large number of categories, and the hypothesis of Joyce and Hunt (1967) that these teachers are more likely to be able to select from a

wide repertoire of behaviors those which are most appropriate for the student in a particular situation. The absence of significant differences in the present study dictates against any firm conclusion in support of the Joyce and Hunt hypothesis, but the trend reflected in the higher mean score for System IV teaehers suggests that System IV teachers may be meeting the needs of more students and that further inquiry related to the hypothesis is warranted.

3. Teacher-Student Conceptual System Similarity and Dissimilarity and Student Perceptions of the Classroom Educational Environment. The finding of significant differences between the perceptions of the elassroom educational environment of students who were similar to their teacher in conceptual system and those who were dissimilar for five of the six environmental variables and for total positive responses leads to the conelusion that there is a significant positive relationship between student-teaeher conceptual system similarity and positive student perceptions of the classroom environment. The results of the ω^2 test suggest a particularly strong relationship between the total positive responses on the ESES and the mateh or mismatch of students and teacher.

Finally, an overview of the findings for the present investigation suggests one additional conclusion. Only two of the environmental variables showed signifieant differenees between teachers with the varied conceptual systems, while there were differences between the matehed and mismatched groups of students for all but one of the variables. This leads to the tentative conclusion that the match or mismatch of student and teacher is more significant in

determining student perceptions of the environment than is the teacher conceptual system per se. Again, However, further experimental research will be needed to determine whether such a cause and effect relationship definitely exists.

Implications of the Study

This section presents the implications of the present study for teacher and administrator training, for improving schools, and for further research.

Implications for Teacher and Administrator Training. The empirical findings of the present study regarding conceptual systems and classroom educational environment complement and build upon the empirical work of a number of educators, including Harvey, Hunt, Joyce, Bloom, and Sinclair (see Chapters I and II). Taken together with these earlier studies, the present investigation has important implications for the training of both teachers and administrators.

First, given the considerable evidence that the match or mismatch of teacher and student conceptual systems is significantly related to student perceptions of the classroom educational environment and that matched students perceive that environment more positively, it has become increasingly important that teachers and administrators become knowledgeable with regard to conceptual systems, classroom environment, and student-teacher matching. A review of the state of the field, however, reveals that these subjects are virtually ignored in contemporary educators training. In a recent AERA overview of research on teacher education (Smith, 1971), Robert E. Peck

wrote: "The only discoverable study ever conducted which tackled the complex interaction of different teacher types with different pupil types was done by Heil and Washburne (1962)." The apparent lack of awareness of the work of Harvey, Hunt, McLachlan, Tuckman, and others by one of the more well informed individuals in the field of teacher education is reflective of the general state of the field.

The first step toward increasing awareness and knowledgeability should include familiarizing teacher and administrator trainees with the concept of educational environment and its importance in influencing the development of children's personalities, the basic theory of conceptual systems, and the studies concerning match and mismatch of students and teachers. The second step should be to help educators develop competency in diagnostic procedures. If educators are to be able to apply their knowledge to improving educational environments within their own schools and classrooms, and to matching students, teachers, and environments, they will need skills in measuring environments, and in assessing both their own and their students' conceptual systems. Thus, the educator training process should include familiarizing teachers and administrators with available instruments and teaching them how to use them.

The next step is both the most important and the most difficult. Given some knowledgeability and minimal competency in diagnosis, how can educators be trained to <u>create</u> the multiple environments necessary to meet the needs of individual children, and to effectively match children and environments? If the

teacher discovers that his or her conceptual system is III and that 80 per cent of the students are System I, or if an administrator discovers that 90 per cent of the teachers are System I and 90 per cent of the pupils System III, how can the needs of these children be met?

Possible approaches to the problem are being developed by Joyce (Joyce and Weil, 1972a; Joyce, et al., 1972) and by Hunt (1971) and focus on training teachers to be able to use a wide variety of teaching styles. Thus, although System III and System IV teachers may "naturally" foster a classroom environment with high Autonomy, as indicated by the results of the present study, System I and II teachers may be trained to create environments with high Autonomy, even though that may not be their natural inclination. Similarly, System III teachers may be trained to foster environments with a high degree of structure and System II teachers to foster environments with high Morale, even though the present study indicates they will more often rate lower in these characteristics than teachers with other systems.

Joyce's approach emphasizes a combination of theoretical and clinical training, and field experience to help student teachers to be able to utilize a variety of teaching skills and employ a number of different models of teaching with equal effectiveness. The Hunt approach involves diagnosing teacher-trainee conceptual levels and then matching the trainees with the types of training situations which appear most likely to increase their teaching flexibility. The findings of the present investigation provide additional evidence

to support the efforts of both Joyce and Hunt.

As indicated in Chapters I and II, however, both Joyce and Hunt focus on teaching style and devote less attention to other aspects of the classroom environment. The conception and measurement of environment in the present study included inter-student behavior as well as teacher behavior. To create different environments, teachers must not only be trained in different presentation styles but in the complexities of grouping children within a class, flexible scheduling within their own classrooms, and other ways of individualizing instruction within that classroom. Given this training, a teacher may be able to provide greater opportunities for System III children to work in groups, while System IV children engage in independent study, System I children work in structured situations, and so forth. Similar training is needed for administrators so that they can help design school-wide and system-wide programs for the same purposes.

Although the third hypothesis in the present study was not supported, there were higher scores for total positive responses on the ESES across the classrooms of System IV teachers than across the classrooms of System I, II, or III teachers. This finding provides some additional support for the hypothesis of Hunt and Joyce (1967, p. 254) that System IV teachers are more likely to be adaptable in teaching style and thus able to meet the needs of more learners. In a similar vein, Joyce recently reported (Joyce, et al., 1972) that while teachers in all conceptual systems could be trained in the varied models of

teaching, teachers with higher conceptual levels were most efficient in over-all practicing of the models. More specifically, Joyce indicated that the Hunt Conceptual System Test was the only personality measure used that related to performance in practicing the different teaching models. Thus, he wrote (p. 56):

> Overall Model Efficiency was correlated with conceptual level (CL) (r=.420) which supports the prediction one would make from Conceptual Systems theory - that conceptual flexibility would not facilitate one model, but would be related to the overall ability to shift styles and carry out a range of models.

Taken together, the findings of the present study and those of Joyce have a number of possible implications. Since higher conceptual level teachers appear to be both easiest to train and most flexible in the classroom, teacher training institutions, in most cases faced with more applicants than either places or available jobs, could give preference to applicants with higher conceptual levels, all other important characteristics being equal. Another possibility would be to place some emphasis on moving individual trainees toward higher conceptual levels. Both Harvey (1970b, pp. 81-92) and Hunt (1971) have provided limited evidence to indicate that this is possible.

Given the considerable evidence that a variety of teacher characteristics are related to quality teaching, and given the lack of conclusive evidence that any one characteristic is most important, the latter approach, coupled with the recommendations made earlier in this section, appear to be most advisable at this time. This requires, however, that those invested with responsibility for

educator training devote far more attention to classroom environment, conceptual systems, and teacher-student matching than is generally the case at the present time.

Implications for School Improvement. Changes in teacher and administrator training will ultimately lead to changes behind classroom doors. There are, however, aspects of schooling which are not likely to be changed solely through reform in pre-service educator training. Teacher selection and placement, curriculum development within the school, student and teacher matching, and the use of student perceptions in diagnosis and evaluation, all fall outside the general realm of training institutions and within the domain of the few administrators and teachers responsible for major decision making within the institution. The present study has implications for each of these aspects of schooling.

System III teachers have classrooms with significantly higher Autonomy, those of System I have significantly less Autonomy, and those of System II significantly lower Morale. The classrooms of System IV teachers have the highest number of total positive responses across environment variables. These findings have definite implications for teacher selection and teacher placement. Depending on the missions and objectives of the school, a priority could be placed on hiring those teachers who appear most likely to foster the type of classroom environment desired by the school. Thus, for example, the school which wishes to create more open environment classrooms or to implement integrated day programs may wish to place a priority on hiring System III or System IV

teachers, ones who seem most likely to help create and/or perpetuate environments with high Autonomy. It appears unlikely that most System I teachers would be as likely to do so. The school which wishes teachers to function with equal effectiveness in a wide variety of educational environments might wisely consider hiring more System IV teachers.

Teaeher assignments within the institution could be looked at similarly. The school which is in the process of changing in the direction of increased Autonomy for children could place the greatest responsibility for the first open classrooms in the hands of those teachers who are likely to be most inclined to foster classroom environments high in Autonomy. Teachers' conceptual systems appear to be one of the characteristics likely to predict such inclinations. On the other hand, to assign a teacher who is clearly System I to implement open edueation without considerable supporting evidence from other sources or an effective training program would be foolish.

One alternative to the use of conceptual systems of teachers for selection or placement purposes would be to implement the type of teacher and administrator education program outlined earlier in this chapter on an in-service basis. Thus, teachers and administrators within the school would be trained to use different skills and styles, alter classroom environments, diagnose student eonceptual systems, and so forth.

The variations among students in eonceptual system (see p. 97) suggests additional implications related to currieulum. The child who scores

highest in Need for Structure (System I) and the student who scores highest in Independence (System IV) differ in needs and in preferred learning style. To meet these different needs and preferences, and to facilitate optimal affective and cognitive development for each child, different objectives, learning opportunities, and means of evaluation should be provided. This is not to suggest that conceptual system differences should be the sole or even the major criteria for determining differences between children, but the evidence suggests that it should be an important criteria. More importantly, the findings of the present investigation provide further evidence that individual differences among children should be matched by differences in the environments provided for children.

The answer lies in creating schools and classrooms which are more pluralistic. The type of pluralistic curriculum suggested by Joyce presents one alternative; Fantini and Weinstein (1968) have presented another. The specific alternative chosen is less important, however, than the development and/or the adoption by the school and by individual teachers of curriculum which will create pluralistic environments to meet the diverse needs of individual children. In such environments System I children could work within highly structured situations, with clearly delineated objectives, frequent feedback concerning their progress, and with gradual exposure to less structured learning situations. System III children could spend greater time in group learning opportunities, and System IV children engage in more independent study, working towards objectives which they have helped delineate.

Additional implications are found in relation to the matching of students and teachers. The finding that students whose conceptual systems are similar to their teacher's perceived the classroom environment far more positively than students who were dissimilar suggests that greater attention should be given to the careful matching of students and teachers. The assignment of students to classes rarely includes an examination of teacher and student characteristics and needs. It should. Student perceptions of the environment are likely to help determine their attitudes and behavior. This in turn will influence their achievement. Thus, the conceptual system match or mismatch, which is significantly related to these perceptions, must be given careful consideration. This does not necessarily mean that System I students should always be matched with System I teachers. Although that might be advisable where the most positive student perceptions appear likely to promote achievement, it would be less advisable where dissonance between teacher and student systems would most likely promote achievement (see Hunt, 1970). In either case, however, the conceptual systems of teachers and students would be considered in making the decision.

Finally, this study provides additional evidence that student perceptions can serve to effectively measure environmental variables that exist and differentiate among elementary school classrooms. If, indeed, schools are primarily for children and if children's perception of their environment help determine their behavior, instruments such as the ESES should be used by

teachers and administrators to create objectives and learning opportunities using the learner as the data source, and to continually assess the way in which the environment has been altered by changes in objectives and learning opportunities. Thus, for example, where a classroom scores low in Involvement, new objectives and learning opportunities could be designed by the teacher to increase Involvement, with the second administration of the instrument used to assess whether Involvement has increased.

Implications for Further Research. The implications for further research fall into three categories: research specifically related to classroom educational environment, research concerning conceptual systems, and research into the relationship between conceptual systems and classroom educational environment.

1. Classroom Educational Environment. - Earlier studies by Sinclair (1968), Sadker (1971), Bender (1971), and McKay (1971) provided evidence of the value of the ESES in measuring environmental variables that exist and differentiate among schools. The present adaptation has provided similar evidence with regard to classroom environmental variables. At the same time, the factor analysis, reliability check and distribution of scores raise questions about the validity and reliability of some of the variables and suggest the need for further refinement. Although Involvement, Autonomy, and Morale appear to be relatively strong, the variables of Humanism, Equity, and Resources need improvement.

One fruitful approach to refining the instrument would be to select only those items which have consistently been shown to be pertinent to their respective dimensions, to generate a large number of new items which appear likely to measure each dimension, and to possibly construct additional variables. The sampling would be repeated with a larger number of classrooms, national in scope, if possible. This analysis would either exclude the weak variable of Humanism or would divide it into three new variables based on its apparent components: humanism, the humanities, and propriety. Using a number of checks of reliability and validity, including a factor analysis, the result would be the development of a strengthened instrument, with an increased number of items for each variable. Further field testing could then be used to determine those items which factor most strongly to their respective dimensions; all other items would be eliminated. The final instrument would contain an even number of items for each variable, each one heavily weighted for that variable.

The present study provided valuable information concerning the relationship between classroom educational environment and two other variables, teacher and student conceptual systems. Further studies inquiring into the relationship between environment and other classroom variables may prove beneficial. The relationship of classroom educational environment to subject matter has been given some attention by Anderson and Walberg on a secondary school level but has been virtually untouched on the elementary school level. The relationship between classroom environment and affective education

remains relatively unexplored. Curriculum being developed by the Center for Humanistic Education at the University of Massachusetts and by the DRICE project at the University of California at Santa Barbara is designed to increase emphasis on the affective characteristics of learners. Useful studies could involve an assessment of changes in classroom environments following the introduction of this curriculum. Does children's sense of Involvement increase or decrease? What happens to classroom Morale? Does Autonomy change? The answers to these and similar questions would help provide these educators with some measure of the extent to which they were attaining their desired ends.

Another fruitful area for further research would be further investigation of the relationship between specific environmental variables and student achievement and intelligence. The relationships described in Chapter II of the present study were largely deduced from earlier studies such as those of Wolf and Dave, but they have not been empirically tested. Both simultaneous and follow-up data are needed on the achievement and intelligence scores of students completing the ESES. Such data could, for example, indicate whether there is a positive relationship between students' sense of Involvement and high achievement scores.

The present study provides additional evidence of the value of using student perceptions of the educational environment and also complements the earlier work by Hunt, Joyce, and Harvey which employed perceptions of the environment by outside observers in studying the relationship of classroom

environment to conceptual systems. There is a need, however, to bring both Alpha and Beta press perceptions together in the same study to determine whether outside observers and students perceive classroom environment variables such as Involvement, Morale, and Autonomy in similar fashions. This would provide valuable data concerning similarities and differences which would be helpful in later studies utilizing Alpha press and/or Beta press feedback.

2. Conceptual Systems.- Further research concerning teacher and student conceptual systems is also potentially valuable. If the assessment of conceptual systems is to become an integral part of the school process, as is recommended earlier in this chapter, the instruments need to be both psychometrically sound and easy to score. The TIB test for teachers appears to meet the first criteria, but the need for "expert" scorers makes it somewhat impractical for use within schools at the present time. One possible answer lies in the Conceptual Systems Test developed by Harvey, which is relatively easy to score. This instrument is not effective, however, in measuring either openness or complexity, both of which are needed to identify System IV individuals. Thus, one valuable piece of research and development would be the refinement of that instrument to provide a more accurate measure of both of those characteristics.

The results of the present investigation demonstrated that the Student Self-Conception Test has concurrent validity and the factor analysis and reliability check indicated sufficient construct validity and reliability to justify

its use. Also, the test is relatively easy to score. At the same time, the use of the same item for more than one variable is a questionable procedure and a number of items also had very low correlations with the factors with which they were identified. Refinement of this instrument through further research could include the elimination of some items, the generation of new items, and the identification of each item with only one variable.

Another possible alternative would be to refine the Hunt Sentence Completion Test and facilitate the process of scoring it. This instrument provides a more direct measure of student conceptual systems than does the SSCT. However, like the TIB it is difficult to score and is therefore impractical for use within schools.

In a similar vein, research into the relationship between the Harvey and Hunt approaches to conceptual systems would be extremely valuable. How do Harvey's four systems and Hunt's three systems relate to each other? How do individual's scores correlate on the Harvey and the Hunt tests? Which system provides a more accurate index of teacher behavior? These and other questions remain to be answered and until they are the decision regarding which measures to employ will be left largely to research bias or to convenience.

Finally, continued research into the relationship of student-teacher conceptual system matching to other variables is needed. The present study showed the value of examining the relationship to student perceptions of the classroom environment and studies by McLachlan and Tomlinson, described

in Chapter II, have explored the relationship to student achievement. More studies are needed, however, concerning the relationship of student-teacher conceptual system matching to various aspects of student affective and cognitive growth. In particular, longtitudinal studies are needed to provide data on the long range effects of such matching.

3. Conceptual Systems and Classroom Educational Environment.- The present investigation inquired into the relationships between conceptual systems and classroom educational environment and in so doing found significant differences in the perceptions of the environment between those students similar to the teacher in conceptual system and those students dissimilar to the teacher. Further research into this relationship is needed. Campbell and Stanley (1966) have suggested that determining relationships between phenomena may serve as a useful prelude to experimental research. The significant relationships suggested by the present study could serve as a starting point for future experimental research designed to test causal relationships between specific teacher conceptual systems and the classroom environmental variables of Autonomy and Morale. Similarly, inquiry into causal relationships between student-teacher conceptual system matching and mismatching and student perceptions of the classroom environment could be approached through an experimental design in which such matching and mismatching is carefully controlled by the experimenter.

The present investigation has additional implications for the design of such experimental studies. In their research Hunt and Joyce tend to equate environment with instructional form. It should not be surprising that they discovered relationships between teacher conceptual systems and "environment," since we can generally expect one's personality to influence one's behavior. The present study used a broader definition of environment and placed increased emphasis on student behavior within the classroom. The findings of relationships between teacher conceptual systems and the classroom environment thus take on increased power. Therefore, it is recommended that the experimental studies utilize a definition of classroom environment similar to the one used in the present study and instrumentation which measures environment in accordance with the definition. Additionally, it is recommended that both Alpha press and Beta press assessment be used to provide as broad a perspective as possible in measuring the environment.

There was no attempt in the present study to inquire into the relationship between student conceptual systems and the classroom educational environment. One teacher, interviewed after completing the TIB test, indicated that his class had been together as a group for four years and had "brought their environment with them." Whether true or not, his comments serve as a reminder that students may play a major role in shaping the classroom environment and may also influence teacher behavior. Too often the assumption is made that the teacher is the one who determines the classroom environment; the role of the

student is neglected. Inquiry into the relationship between student characteristics, such as conceptual systems, and the classroom environment is needed.

A replication of the present study is another possible path of future inquiry. The present study was delimited by sample size, geographic location, and the absence of an inner-city sample. In addition, some weaknesses were discovered in two of the instruments. A follow-up study with a larger sample, national in scope, the inclusion of inner-city populations, and refined editions of the ESES and SSCT, could provide additional useful data.

Finally, this study began with the assumption that to make schools better for children we must give major attention to developing multi-faceted educational environments designed to meet the diverse needs of individual learners. It was further assumed that to develop these environments and to match students, teachers, and environments requires continued inquiry into the relationship between teacher characteristics, student characteristics, and classroom educational environments. It is hoped that the present investigation has made some contribution to the development of these environments and has provided data that will be useful to teachers and administrators in their efforts to meet the needs of the individual learners for whom they are responsible. Further, it is hoped that this study will stimulate other researchers to engage in the type of inquiry which is vitally needed to provide greater understanding of teachers, learners, and environments, and of the relationships between them.

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APPENDICES

APPENDIX A

GROUPING OF QUESTIONNAIRE ITEMS BY FACTOR

APPENDIX A1

GROUPING OF ESES ITEMS BY FACTORS

I. Involvement

11. Students do not pay much attention to classroom rules and regulations. (False)

25. Most students in this classroom take a lot of care about their schoolwork. (True)

35. The teacher is too busy to talk to students about their problems or to give them extra help. (False)

37. Students in this classroom sometimes make plans to do something bad to the school. (False)

41. This classroom seems to be an unfriendly place. (False)

48. The teacher in this classroom cares about the problems that students are having. (True)

II. Humanism

16. The teacher in this classroom tries extra hard to help students. (True)

18. Most students in this class are not interested in such things as poetry, music, or painting. (False)

22. Students in this classroom often interrupt while someone else is talking. (False)

23. This class teaches students to be polite. (True)

26. Students in this classroom have many chances to help other students. (True)

33. The teacher does not talk to students about concerts, plays and museums. (False)

III. Autonomy

10. Students almost always wait to be called on before speaking in this classroom. (False)

12. Students often tell the teacher what they would like to study. (True)

19. Students often work in small groups of about three or four students without the teacher. (True)

32. Students in this classroom do not work on projects by themselves. (False)

40. Most students in this class do not like to get into any kind of argument. (False)

47. The teacher in this classroom watches the students closely when they work to make sure there are no mistakes. (False)

IV. Morale

17. The teacher in this classroom is unfriendly. (False)

24. Many students in this classroom help each other with their classwork. (True)

29. Many of the students in this classroom say that they do not like the rules made by the teacher. (False)

34. Many students in this classroom get into trouble with the teacher. (False)

43. Many of the students in this class are unhappy about the class. (False)

44. The students in this classroom feel like they are one big family. (True)

V. Equity

20. One way to get good grades in this classroom is to be nice to the teacher. (False)

30. Students in this classroom know when they can get away with doing something wrong. (False)

36. It is difficult for students in this classroom to get the teacher to like them. (True)

39. The teacher in this classroom usually checks to make sure that students finish their school work. (True)

46. When students do something wrong in this classroom, they usually get caught. (True)

50. Students in this classroom will have it easier if the teacher knows them well. (False)

VI. Resources

13. Students may take books or other materials from the shelves without the permission of the teacher. (True)

28. This classroom has very few exhibits and pictures for students to look at. (False)

38. Students in this classroom often take field trips to interesting places. (True)

42. In this classroom students have many chances to listen to music. (True)

45. Sometimes students in this classroom watch lessons on television. (True)

APPENDIX A2

GROUPING OF SSCT ITEMS BY FACTORS

I. Need for Structure

8. When the class is noisy it bothers me. (True)

9. Sometimes I get mad at my teacher. (False)

14. I like to be told exactly what work to do and how to do it. (True)

18. It's O.K. if other children talk to me or hang around when I'm working. (False)

19. I get along well with my teachers most of the time. (True)

23. I like to work by myself. (True)

II. Hostility

9. Sometimes I get mad at my teacher. (True)

12. I feel bad when other children get mad at me. (False)

16. If I could I'd fight with lots of people. (True)

19. I get along well with my teachers most of the time. (False)

20. I like it when I can do things my own way. (True)

22. I'd like to fight anybody who tries to push me around. (True)

III. Sociability

10. I get along with the other children in my class. (True)

11. I like to have lots of friends. (True)

12. I feel bad when other children get mad at me. (True)

13. I like to work with other children. (True)

16. If I could I'd fight with lots of people. (False)

19. I get along well with my teachers most of the time. (True)

21. I like almost everybody in my class. (True)

24. Most children are fun to play with. (True)

IV. Independence

8. When the class is noisy it bothers me. (False)

12. I feel bad when other children get mad at me. (False)

14. I like to be told exactly what work to do and how to do it. (False)

17. If I'm not sure what we are doing in our school work it makes me feel scared or worried. (False)

18. It's O.K. if other children talk to me or hang around when I'm working. (True)

APPENDIX B

QUESTIONNAIRE BOOKLETS

APPENDIX B1

ELEMENTARY SCHOOL ENVIRONMENT SURVEY (Classroom Edition)

Instructions to the Students

We are interested in your ideas about your classroom. You know a lot about the classroom because you spend a good part of your time in school working and learning there. We are asking you to be a reporter and tell your thoughts about your classroom.

Please understand that this is not a test, and there are no right or wrong answers. In fact, we do not even ask your name. We simply want your honest ideas about your class. Thank you for helping us.

Please read each item carefully and answer in terms of how well the statement describes your classroom. Please mark your responses to each item clearly on the answer sheet provided. Use pencil only. Erase completely to change answers.

Marking Answers to Biographical Information (Use items 1-8 on the answer sheet)

1-3. Fill in the school number as directed by the proctor.

4-5. Fill in the class number as directed by the proctor.

6. Sex: Girl: 1
   Boy: 2

7. Grade: Fifth: 1
   Sixth: 2
   Ungraded: 3

8. Please indicate how long you have been in this class.

Since school began in September: 1
I entered the class after September but before January: 2
I entered the class after January: 3

Marking Answers to Sentences

There are forty-two sentences about classrooms in this booklet. You are to mark each sentence TRUE or FALSE. When you think a sentence correctly describes your classroom mark that sentence TRUE by filling in space number 1 on the answer sheet. In other words, blacken in space number 1 if you think the sentence tells the way things usually are in your classroom, what happens or might happen there, or the way people usually act or feel.

Fill in space number 2 on the answer sheet if the sentence is FALSE, or is not the way things usually are in your classroom, is not what happens or might happen there, or is not the way people usually act or feel.

The following sample shows how to mark a sentence:

Sample sentence:

	1	2	3	4	5
Homework in this class is very easy.	■	□	□	□	□

In this example the student marked box number 1 on the answer sheet to show that homework in this class is very easy. In other words, the student reported that the sentence was TRUE.

Now you are ready to mark each of the forty-two sentences in the booklet. It is important to remember that the sentences are about your classroom.

Think about each sentence carefully and answer as honestly as you can. Take your time and mark only one space for each sentence. Make sure all sentences are marked.

Find sentence 9 below and space number 9 on the answer sheet and begin.

9. Students in this classroom are very quick to tell the teacher about things that should be changed.

10. Students almost always wait to be called on before speaking in this classroom.

11. Students do not pay much attention to classroom rules and regulations.

12. Students often tell the teacher what they would like to study.

13. Students may take books or other materials from the shelves without the permission of the teacher.

14. Students do not get any special favors in this classroom.

15. Many students like to stay around after the class is over.

16. The teacher in this classroom tries extra hard to help students.

17. The teacher in this classroom is unfriendly.

18. Most students in this class are not interested in such things as poetry, music, or painting.

19. Students often work in small groups of about three or four students without the teacher.

20. One way to get good grades in this classroom is to be nice to the teacher.

21. Students know who the most important people are in this classroom.

Turn to the next page please

22. Students in this classroom often interrupt while someone else is talking.

23. This class teaches students to be polite.

24. Many students in this classroom help each other with their classwork.

25. Most students in this classroom take a lot of care about their school work.

26. Students in this classroom have many chances to help other students.

27. The teacher seldom takes this class to the library so that students can look up information.

28. This classroom has very few exhibits and pictures for students to look at.

29. Many of the students in this classroom say that they do not like the rules made by the teacher.

30. Students in this classroom know when they can get away with doing something wrong.

31. Many students in this class do not behave while they are on the playground.

32. Students in this classroom do not work on projects by themselves.

33. The teacher does not talk to students about concerts, plays and museums.

34. Many students in this classroom get into trouble with the teacher.

35. The teacher is too busy to talk to students about their problems or to give them extra help.

36. It is difficult for students in this classroom to get the teacher to like them.

Turn to the next page please

37. Students in this classroom sometimes make plans to do something bad to the school.

38. Students in this classroom often take field trips to interesting places.

39. The teacher in this classroom usually checks to make sure that students finish their school work.

40. Most students in this class do not like to get into any kind of argument.

41. This classroom seems to be an unfriendly place.

42. In this classroom students have many chances to listen to music.

43. Many of the students in this class are unhappy about the class.

44. The students in this classroom feel like they are one big family.

45. Sometimes students in this classroom watch lessons on television.

46. When students do something wrong in this classroom, they usually get caught.

47. The teacher in this classroom watches the students closely when they work to make sure there are no mistakes.

48. The teacher in this classroom cares about the problems that students are having.

49. If students are unhappy in this class, the teacher will call their parents.

50. Students in this classroom will have it easier if the teacher knows them well.

END

THANK YOU

APPENDIX B2

THIS I BELIEVE TEST
(Form TIB-71)

Name_____

School Number_____

Teacher Number_____

INSTRUCTIONS

In the following pages you will be asked to write your opinions or beliefs about several topics. Please write at least two (2) sentenees about each topie. You will be timed on eaeh topie at a pace that will make it neeessary for you to work rapidly.

Be sure to write what you genuinely believe.

You must write on the topies in the order of their appearance. Wait to turn each page until the experimenter gives you the signal. And onee you have turned a page, do not turn baek to it.

PLEASE DO NOT OPEN THIS BOOKLET UNTIL YOU ARE INSTRUCTED TO BEGIN.

This I believe about the American way of life.

This I believe about religion.

This I believe about people.

This I believe about law and order.

This I believe about life after death.

This I believe about marriage.

This I believe about guns.

This I believe about friendship.

This I believe about abortion.

This I believe about legalizing marijuana.

APPENDIX B3

STUDENT SELF-CONCEPTION TEST

Instructions for Students

We are interested in how you think, feel, and act in school. Please understand that this is not a test, and there are no right or wrong answers. In fact, we do not even ask your name. We simply want your honest ideas.

The items in this questionnaire describe different ways students may think, feel, or act. Please read each item carefully and answer in terms of how well the statement describes your thoughts, feelings, and actions. Please mark your response to each item clearly on the answer sheet. Use pencil only. Erase completely to change answers.

Marking Answers to Biographical Information (Use items 1-7 on the answer sheet)

1-3. Fill in the school number as directed by the proctor.

4-5. Fill in the class number as directed by the proctor.

6. Sex: Girl: 1
Boy: 2

7. Grade: Fifth: 1
Sixth: 2
Ungraded: 3

Marking Answers to Sentences

There are eighteen sentences in this booklet. You are to mark each

sentence TRUE or FALSE.

When you think that a sentence correctly describes your thoughts, feelings, or actions mark that sentence TRUE in space number 1 on your answer sheet.

Fill in space number 2 on the answer sheet if the sentence is FALSE or is not the way you think, feel, or act.

The following sample shows how to mark a sentence:

Sample sentence:

	1	2	3	4	5
I get along well with my teachers.	■	□	□	□	□

In this example the student marked box number 1 on the answer sheet to show that the student gets along well with his or her teachers. In other words, the student thought the sentence was TRUE.

Now you are ready to mark each of the eighteen sentences in the booklet.

Think about each sentence carefully and answer as honestly as you can. Take your time and mark only one space for each sentence. Make sure all sentences are marked.

Find sentence 8 below and space number 8 on the answer sheet and begin.

8. When the class is noisy it bothers me.

9. Sometimes I get mad at my teacher.

10. I get along with the other children in my class.

11. I like to have lots of friends.

12. I feel bad when other children get mad at me.

13. I like to work with other children.

14. I like to be told exactly what work to do and how to do it.

15. I like to find out more by myself about our school work.

16. If I could I'd fight with lots of people.

17. If I'm not sure about what we are doing in our school work if makes me feel scared or worried.

18. It's O.K. if other children talk to me or hang around when I'm working.

19. I get along well with my teachers most of the time.

20. I like it when I can do things my own way.

21. I like almost everybody in my class.

22. I'd like to fight anybody who tries to push me around.

23. I like to work by myself.

24. Most children are fun to play with.

25. Other children pick on me a lot.

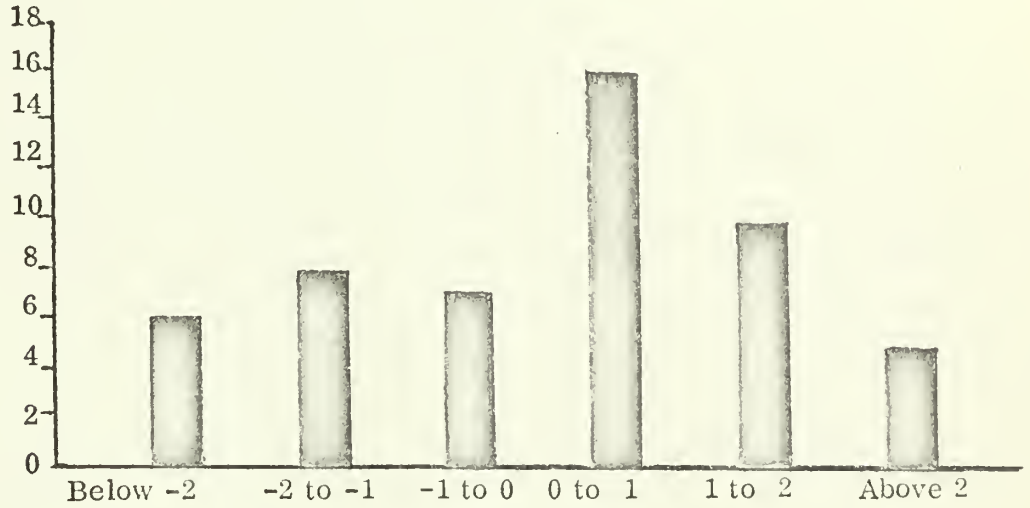
THE END

THANK YOU

APPENDIX C

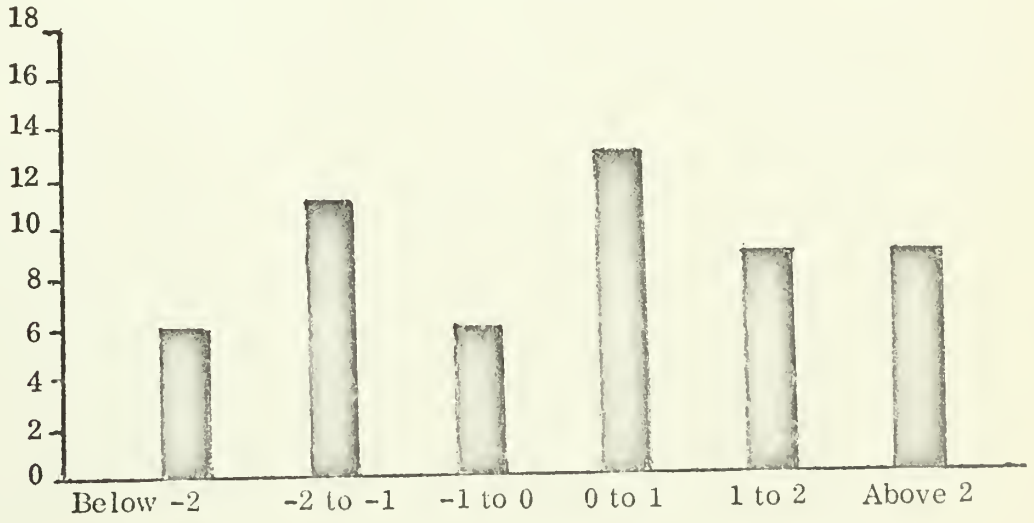
DISTRIBUTION OF CLASSROOM SCORES ON EDUCATIONAL ENVIRONMENT VARIABLES

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES FOR THE ENVIRONMENT VARIABLE OF INVOLVEMENT



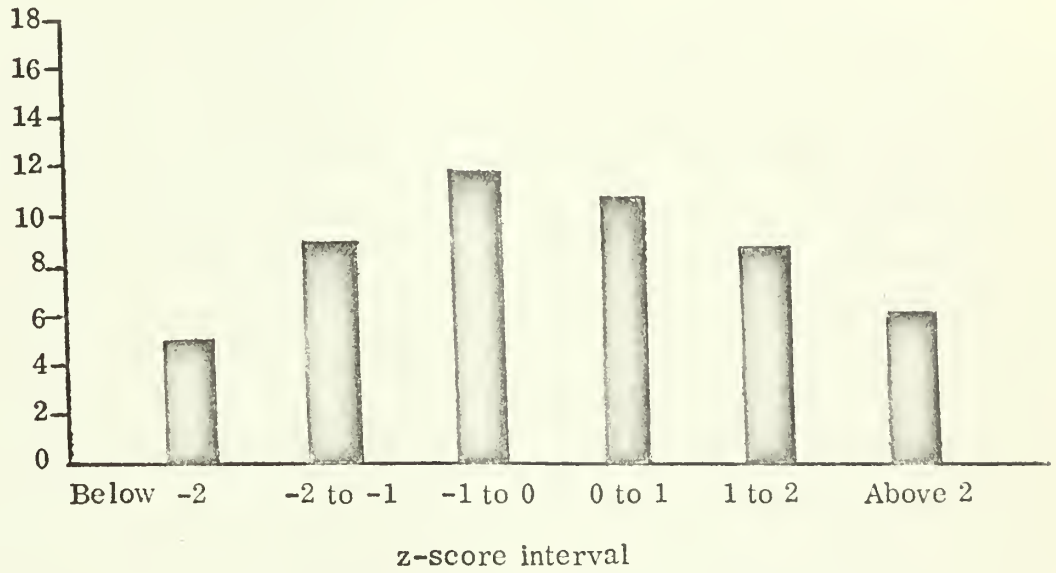
Standardized Classroom Scores for Involvement

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES FOR THE ENVIRONMENT VARIABLE OF HUMANISM



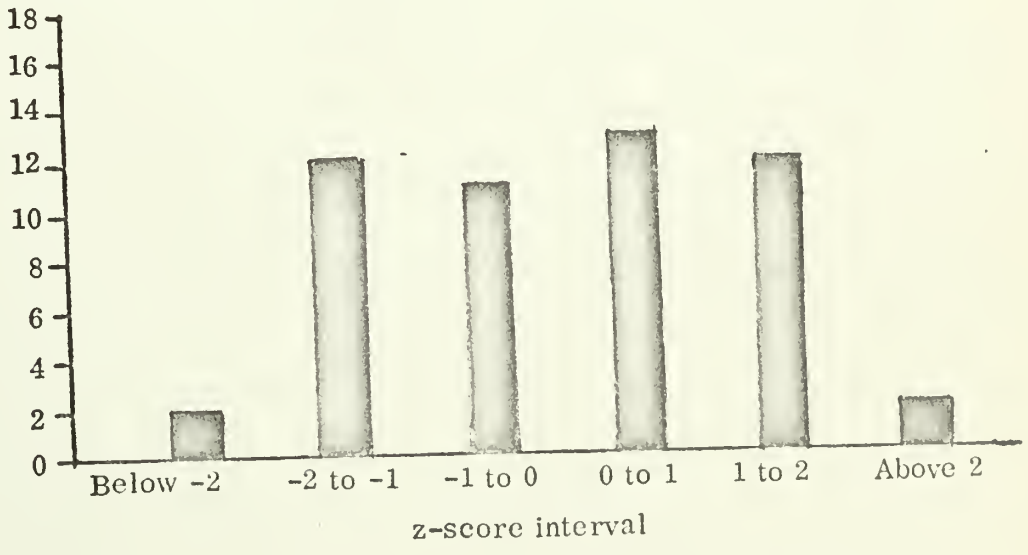
Standardized Classroom Scores for Humanism

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES
FOR THE ENVIRONMENT VARIABLE OF AUTONOMY



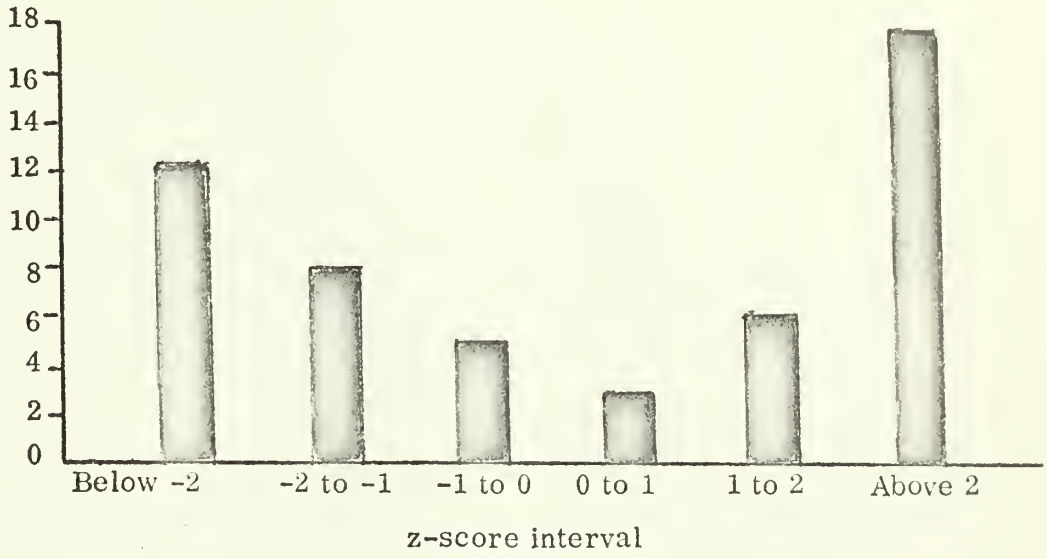
Standardized Classroom Scores for Autonomy

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES
FOR THE ENVIRONMENT VARIABLE OF MORALE



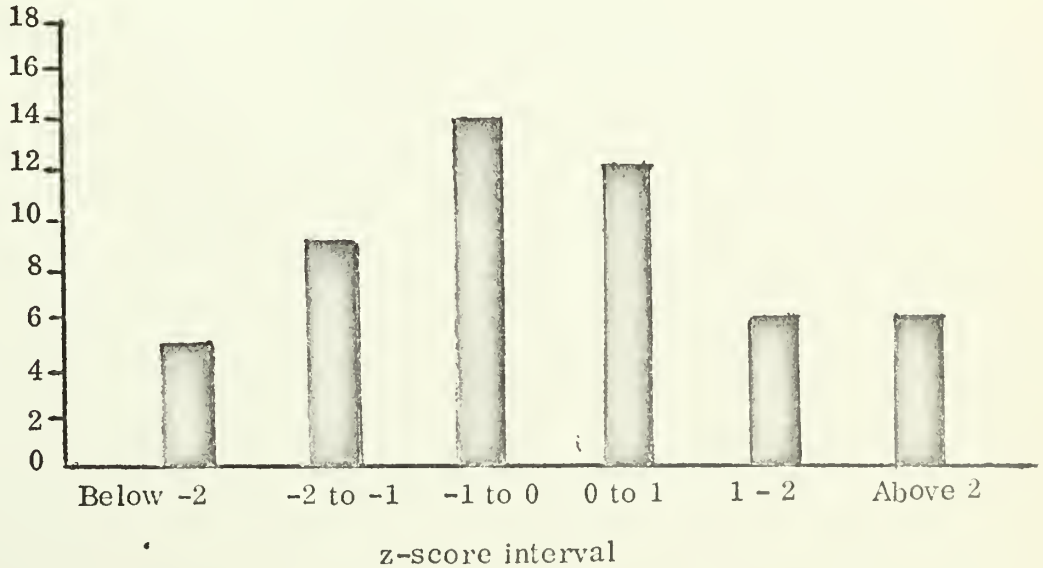
Standardized Classroom Scores for Morale

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES
FOR THE ENVIRONMENT VARIABLE OF EQUITY



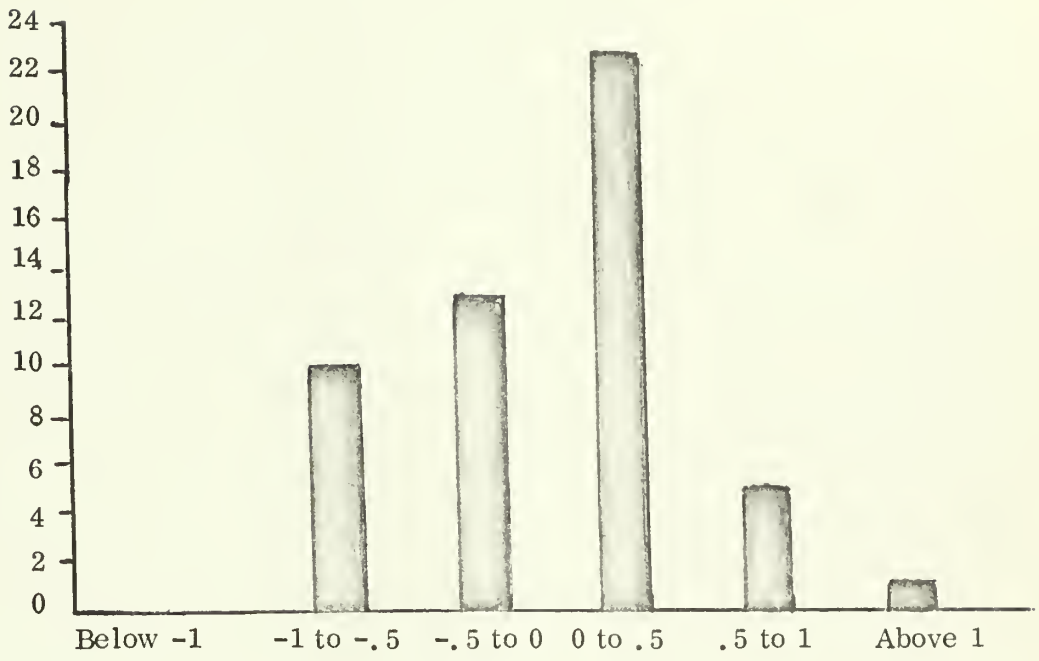
Standardized Classroom Scores for Equity

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES
FOR THE ENVIRONMENT VARIABLE OF RESOURCES



Standardized Classroom Scores for Resources

DISTRIBUTION OF STANDARDIZED CLASSROOM SCORES
FOR TOTAL POSITIVE RESPONSES ON THE ESES



Standardized Classroom Scores for Total Positive Responses on the ESES